October 15, 2013
City Commission Room, 700 N. Jefferson, Junction City KS 66441

Mayor Cecil Aska
Vice Mayor Pat Landes
Commissioner Mick McCallister
Commissioner Jim Sands
Commissioner Michael Ryan
City Manager Cheryl Beatty
City Attorney Catherine Logan
City Clerk Tyler Ficken

1. **6:00 P.M. - CALL TO ORDER**

2. **NEW BUSINESS:**

   a. Discussion on Proposed Changes to the City Engineering Design Standards

3. **ADJOURNMENT:**

Backup material for agenda item:

a. Discussion on Proposed Changes to the City Engineering Design Standards

City of Junction City
City Commission
Agenda Memo

October 15, 2013

From: Gregory S. McCaffery, Municipal Service Director

To: Cheryl Beatty, Interim City Manager and City Commissioners

Subject: City Commission Workshop – City of Junction City, Engineering Design Standards and Related Ordinance Amendments

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Objective: Workshop Overview of Proposed City of Junction City Engineering Design Standards

Explanation of Issue: City has various ordinances, standards, guidelines and policies which govern the design and construction of infrastructure improvements within the City. Many of these are outdated, incomplete and inconsistent with current standard engineering practices and methods of construction. Further, several of the ordinances contain limited design guidelines and areas of construction specifications which are inconsistent with present methods.

This lack of current and updated ordinances, and absence of a solid set of *Engineering Design Standards* have made it difficult in the City being able to provide and ensure; (1) consistent infrastructure is built, (2) guidance towards design professionals is given and (3) enforcement of standard practices and methods are undertaken within the City as developments take place and City staff maintains the City's overall infrastructure.

City staff, along with HDR Engineering, over the last several months have been working on an overall review of the current City Code Design Standards, with an emphases on the development of a standalone "*Engineering Design Standards*" document, which would be current with standard design practices and methods which are used with the industry, throughout Kansas and more importantly within our region, Further, a cleanup of various City Code inconsistencies was undertaken. Finally input was obtained from the various City Departments, KAW Engineering, local contractors, and Tom Neal, the City's former City Engineer as the standards were developed.

The City Code Titles, Chapters and Sections which will be impacted by these revised *Engineering Design Standards* include the following: Title IV – Land Use (primarily the subdivision regulations), Title V - Building and Construction, And Title VII – Utilities (Water & Sanitary Systems). A Public Hearing for the recommended changes within the Subdivision Regulations has already been held through the Metropolitan Planning Commission. It is intended these standards will be further amended once the City's Update to the Comprehensive Master Plan and Storm Water Management Master Plan documents are developed. The recommended City code changes are included within the overall packet.

The *Engineering Design Standards* address the following major areas: General Conditions, Water Systems, Sanitary Systems, Storm Systems and Street

Systems. Additionally a set of current Standard Detail Sheets for the major areas of construction have been developed for adoption by the City.

City staff's final intent will be to allow the City Commission the means to adopt a sound set of *Engineering Design Standards* by resolution and reference throughout the City Code, under the various Titles, Chapters and Section. These documents will allow developers and design professionals a means to understand the City's requirements towards design and construction of sound infrastructure within the City.

City staff, after receiving City Commission input would look to formally bring before the Commission a formal ordinance amendment, a set of *Engineering Design Standards* (with Standard Detail Sheets) and related fee schedules for the Commission consideration and adoption.

Budget Impact: The *Engineering Design Standards* will standardize the City's infrastructure and minimize the types of systems in which to maintain and limit future repairs through sound standards.

Alternatives: No Action is requested at this time, yet feedback and input is requested.

Recommendation: N/A.

Suggested Motion: N/A.

Enclosures: Recommended City Code Amendments
Title IV – Land Use, Title V Building & Construction and
Title VII – Utilities (Water and Sanitary)
Engineering Design Standards
Standard Detail Sheets

TITLE IV. - LAND USE

CHAPTER 420: - OFF-STREET PARKING AND LOADING

ARTICLE I. - OFF-STREET PARKING

SECTION 420.020: - GENERAL PROVISIONS

E. *Design and Maintenance.*

1. *Design.* Off-street parking spaces shall comply with such design standards relating to curb length, stall depth, driveway width, island width, barriers, and ingress and egress as may be established from time to time by the City. Off-street parking spaces may be open to the sky or enclosed in a building. For multi-family residential housing in excess of two (2) units, parking spaces must be set back a minimum of six (6) feet at the side yard and four (4) feet from any side of a building.

2. *Surfacing.* All open off-street parking areas, access and egress areas, including required parking spaces accessory to a single-family dwelling shall be designed per the City *Engineering Design Standards* as adopted by resolution by the City Commission. ~~graded and surfaced with asphaltic concrete or Portland cement concrete.~~

F. *Multiple-Family Exceptions.* The required accessory off-street parking spaces for three-family and multiple-family residential dwellings may be provided within the public right-of-way of the adjoining streets, except arterials streets and certain collector streets as determined by the City Engineer, fronting on the lot developed for such three-family or multiple-family residential dwellings. No density bonus shall be allowed if the public right-of-way is used in meeting the parking demands of the project. The balance of the lot used for the housing units shall be landscaped and maintained as open space. The parking spaces constructed in the public right-of-way shall be subject to the following:

4. *Sidewalks.* There shall be sidewalks meeting the current minimum standards of the City along the street frontage of all public streets abutting a property on which a three-family or multiple-family residential dwelling is constructed. The sidewalk location within the public right-of-way shall be ~~determined by the City Engineer~~ designed per the City *Engineering Design Standards* as adopted by resolution of the City Commission.

5. *Design.* The design layout of parking provided within the public right-of-way shall be designed per the City Engineering Design Standards as adopted by resolution of the City Commission. ~~determined by the City Engineer. In general, the public street shall be centered in the right-of-way and constructed to the width the either exists in the current street or shall meet the minimum required for the classification of the street. The sidewalks shall be constructed abutting the outer edge of the public right-of-way. The parking spaces shall be between the flow line of the bottom of the curb and the inner edge of the sidewalk.~~

6. *Surfacing.* All parking areas provided within the public right-of-way shall be designed per the City Engineering Design Standards as adopted by resolution of the City Commission. ~~graded to maintain appropriate drainage within the remainder of the street system and surfaced with asphaltic concrete or Portland cement concrete the same as the remainder of the street.~~ In the event the street in question is a brick street, the paving shall be determined by the City Engineer.

7. *Paving over utilities.* All existing or proposed utilities that are common for placement in the normally unpaved area of the public right-of-way that are covered by parking as provided in this Section shall be permitted subject to the requirement that all additional costs for pavement removal and replacement due to subsequent repairs, maintenance or other modifications necessary for the continued operation of said utilities shall be the sole and complete responsibility

of the owner(s) of the housing served by the parking. The costs shall be separated from the total costs for such work and shall be billed directly to the owner(s) of the housing in accordance with the provisions outlined in the agreement required herein. Pavement shall be designed per the City *Engineering Design Standards* as adopted by resolution of the City Commission.

ARTICLE II. - OFF-STREET LOADING

SECTION 420.050: - GENERAL PROVISIONS

D. *Surfacing.* All open off-street loading shall be ~~improved with a compacted select gravel base, not less than seven (7) inches thick, surfaced with an all-weather, dustless material.~~ designed per the City *Engineering Design Standards* as adopted by resolution of the City Commission.

CHAPTER 455: - SUBDIVISION REGULATIONS

ARTICLE VI. - DESIGN STANDARDS

SECTION 455.270: - STREETS—LAYOUT AND DESIGN

A. The arrangement, character, extent, width, grade and location of all streets shall conform to the Comprehensive Development Plan and shall be considered in their relation to existing and planned streets, topographical conditions, to public convenience and safety, and their appropriate relation to the proposed uses of the land to be served by such streets. A developer desiring to construct any street improvement shall in addition to any Planning Commission review and approval, apply to the City of Junction City, Engineering Department ~~appropriate engineer~~ for approval of the location, dimensions, design, ~~and~~ construction methods and material for such street. Street improvements shall be designed per the City *Engineering Design Standards* as adopted by resolution of the City Commission.

H. ~~Wherever possible, there shall be an inside tangent at least fifty (50) feet in length introduced between reverse curves, except that no tangent will be required for a radii longer than five hundred (500) feet.~~

I. ~~Streets shall be laid out so as to intersect as nearly as possible at right angles, and no street shall intersect any other street at more than one hundred degrees (100°) or less than eighty degrees (80°) angle.~~

J. The minimum right-of-way width, roadway with, and other relevant design criteria for all new streets shall be designed per the City *Engineering Design Standards* as adopted by resolution of the City Commission ~~to meet the following requirements for maximum grade and minimum right-of-way width, sight distance, roadway width, and horizontal radii:~~

~~Street Type~~	~~R-O-W Width~~	~~Sight Distance~~	~~Roadway Width~~ [3]	~~Horizontal Radii~~	~~Maximum Grade~~
~~Arterial~~	~~100 Feet~~ [1]	~~600 Feet~~	~~53 Feet~~ [4]	~~500 Feet~~	~~6%~~
~~Collector~~	~~80 Feet~~	~~400 Feet~~	~~41 Feet~~	~~250 Feet~~	~~8%~~
~~Local Residential~~	~~60 Feet~~ [2]	~~200 Feet~~	~~31 Feet~~	~~200 Feet~~	~~10%~~
~~Local Commercial~~	~~80 Feet~~	~~400 Feet~~	~~41 Feet~~	~~300 Feet~~	~~6%~~
~~Local Industrial~~	~~60 Feet~~	~~600 Feet~~	~~41 Feet~~	~~500 Feet~~	~~6%~~
~~Frontage Roads~~	~~40 Feet~~	~~400 Feet~~	~~24 Feet~~	~~250 Feet~~	~~8%~~
~~Cul-De-Sacs~~	~~50 Feet Rad.~~		~~40 Feet Rad.~~		

~~1. Additional right-of-way width may be required on both sides of any intersection with another arterial or collector street.~~

2 May be reduced in a residential planned development district.

3 Roadway width is measured back-to-back of curb.

4 Arterial roadway width is variable; fifty three (53) feet is the minimum.

K. Reserved for future use Streets in suburban subdivisions (see Section 455.350) shall meet the requirement of Section 455.270(J) except as follows:

1.	Minimum paved surface width:		= 24 feet
2.	Minimum roadway width:	Local Street	= 30 feet
		Collector Street	= 46 feet
		Arterial Street	= 46 feet

3 Depth of ditches must be two (2) feet below the shoulder.

4 Ditches shall be flat bottom type with a minimum bottom width of five (5) feet.

5 Shoulder slope shall be 3:1 and back slope shall be 4:1 except that back slope in rock cut may be no less than 3:1.

6 Subgrade shall be six (6) inches of Township Crushed Rock.

7 Entrance culverts shall be no less than twenty four (24) feet in length and may vary in size due to drainage, but no less than twenty one (21) inches by fifteen (15) inches.

8 Crossroad culverts may vary in length and size due to drainage and width of fill, but no less than twenty one (21) inches by fifteen (15) inches.

L. Cul-de-sacs may be paved to a width of twenty six (26) feet if twelve (12) residences or less are on the street. Loop streets may be paved to a width of twenty six (26) feet if eighteen (18) residences or less are on the street. shall be designed per the City *Engineering Design Standards* as adopted by resolution of the City Commission.

M. Dedication of half (½) streets will not be approved, except in the public interest. If a half (½) street dedication should be permitted, the dedicated right of way must be sufficient width to permit construction of at least thirty one (31) feet of pavement, including curbs, in the half (½) dedication. Reserved for future use.

N. Minor streets shall be so planned as to discourage their use by non local traffic, and provisions shall be made for adequate traffic circulation. "Places", "Courts", or cul de sacs will be permitted where topography or other conditions justify their use. Cul de sacs shall normally not be longer than twelve hundred (1,200) feet, including a turnaround which shall be provided at the closed end. Reserved for future use.

O. Sidewalks shall be required on both sides of all streets in urban subdivisions. Minimum sidewalk width shall be five (5) feet along arterial streets and four (4) feet along other streets. Sidewalks shall be designed per the City *Engineering Design Standards* as adopted by resolution of the City Commission placed in the public right of way within one (1) foot of the property line; except that The

Planning Commission, subject to approval of the City Commission, may permit sidewalks at the curb line on local residential streets.

P. ~~No roadway grade shall be less than one-half of one percent (0.5%) unless approved by the appropriate engineer. Greater percentages of grade may be required where necessary to provide adequate drainage.~~ Street grades shall be designed per the City *Engineering Design Standards* as adopted by resolution of the City Commission.

Q. ~~In the event an island is constructed in the center of a cul-de-sac the minimum radius of the island shall be ten (10) feet, six (6) inches from back of curb, however, the minimum pavement width, including curbs, around the island shall be not less than twenty-four (24) feet.~~ Cul-de-sac islands, if constructed, shall be designed per the City *Engineering Design Standards* as adopted by resolution of the City Commission.

SECTION 455.280: - ALLEYS

A. Alleys shall be provided in commercial and industrial districts, except that the Planning Commission may waive this requirement where other definite and assured provisions are made for service access, such as off-street loading, unloading and parking spaces consistent and adequate for the uses proposed. Alleys in residential districts are to be discouraged.

B. ~~When provided, the minimum width of an alley shall be twenty (20) feet.~~ Reserved for future use.

C. Alley intersections and sharp changes in alignment shall be avoided, but where necessary, a turning radius shall be provided to permit safe vehicular movement.

D. Dead-end alleys shall be avoided where possible, but is unavoidable, such alleys shall be provided with adequate turnaround facilities at the dead-end.

E. Construction of alleys shall be designed per the City *Engineering Design Standards* as adopted by resolution of the City Commission.

ARTICLE VII. - CONSTRUCTION STANDARDS

SECTION 455.340: - STREET CONSTRUCTION STANDARDS

A. ~~Pavement Types.~~ Street pavements, grading, curb & gutter, and storm water systems, shall be designed and constructed per the City *Engineering Design Standards* as adopted by resolution of the City Commission. ~~Within the incorporated areas of Junction City. The provisions of the Standard Specifications for State Road and Bridge Construction, State Highway Commission of Kansas, Edition of 1980, or the latest revision thereof, and current Special Provisions, are incorporated herein by reference, except as herein modified. Street pavement shall be one (1) of the following optional types.~~

~~1. Portland cement concrete pavement shall be air-entrained (AE). Contraction joints shall be sawed joints, cut to a depth of two (2) inches and spaced at intervals of fifteen (15) feet. Contraction joints shall be sawed as soon as the fresh concrete will support the sawing equipment. Expansion joints shall be placed at each end of the pavement and at such intermediate intervals as determined by the City or County Engineer. The concrete mix design shall be as approved by the City or County Engineer.~~

2. Asphaltic concrete pavement shall consist of a dense graded hot mix asphaltic concrete surface course and a plant mix bituminous base course of the thicknesses specified below, except in the cases of local residential streets where the base course may consist of rolled stone base to the gradation, density and thickness as approved by the City or County Engineer. The pavement mix designs shall be as approved by the City or County Engineer.

3. *Pavement thickness.* Minimum pavement thickness for streets and alleys within the incorporated area shall be in accordance with the following table:

		ASPHALT THICKNESS		
STREET TYPE	PCC THICKNESS	BASE ROCK	ASPHALT	FULL DEPTH
Arterial	8 inch	12 inch	6 inch	9.5 inch
Collector	8 inch	12 inch	6 inch	9.5 inch
Industrial	8 inch	12 inch	6 inch	9.5 inch
Residential	6 inch	11 inch	4 inch	7.5 inch
Alleys	6 inch	11 inch	4 inch	7.5 inch

Surface type and thickness of street is based on AASHTO structural number for flexible and rigid pavement and an average subgrade classification. Alternative pavement thickness designs will be acceptable provided the designer provides verification of subgraded class equivalent via methods similar to the established CBR of Triaxial Test Methods.

The concrete pavement should be designed on PCA criteria with a modulus of rupture at least six hundred (600) psi. The concrete design address reinforcement, slump, air entrainment, water-cement ratio and additives.

B. *Within Unincorporated Areas of Geary County.* Surfacing types for all suburban (See Section 455.350) subdivisions shall be as follows. Surfacing on local residential streets shall be six (6) inches of rolled stone base course, type AB-3 or equal, with double bituminous surface treatment for all local and residential streets. Arterial and collector streets shall have a six (6) inch rolled stone base course with a minimum of four (4) inch hot mix asphalt surface course. Upon written application and approval of the County Commission or their authorized representative, streets and roads in suburban subdivisions may be surfaced with sand-gravel mixtures. Prior to surfacing sand-gravel mixture rate and specifications must be approved by the County Engineer, County Commission, or their authorized representative. Terms of construction referred to are as specified by the Standard Specifications for State Road and Bridge Construction.

C. Grading. The grading for streets shall consist of excavating, filling, and compacting earthwork within the limits of embankment fill and cut sections in accordance with these specifications and in conformity with the lines, grades, and typical cross sections shown on the plans as approved by the City or County Engineer. Sub-grade shall be compacted under curbs.

D. Grading Limits. The grading limits for streets shall be from right-of-way line to right-of way line.

E. Construction Methods for Grading.

1. Street grading shall be from right-of-way line to right-of-way line. The elevation at the property lines shall be on slope upward of one-quarter (¼) inch to one-half (½) inch per foot from the top of curb. This slope may be varied or exceeded upon written approval of the City or County Engineer.

2. Rough graded areas shall be cut or filled to within two-tenths (0.20) feet of the approved subgrade elevations.

3. Suitable excavated materials shall be used for fills. Unsuitable materials such as organic substances, soft clay, etc., shall be removed from the limits of the work. Tree stumps, masonry, concrete and other obstructions shall be removed to a depth of two (2) feet below sub-grade elevation. Solid rock, shale, or similar materials shall be excavated to a depth of fifteen (15) inches below subgrade for the full pavement width, plus any additional width or depths required for form work, curb construction, drainage structures, etc. The excavated area shall be backfilled and compacted to subgrade or shoulder elevation with material approved by the City or County Engineer.

4. All vegetable matter including sod, shrubs, trees, and other unsuitable materials shall be removed from within the grading limits in cut or fill sections.

5. Fill areas shall be cleared and grubbed prior to placing fill material. Fills in sidehill sections shall be properly benched. Fill material shall be spread in layers not to exceed eight (8) inches loose thickness, manipulated to a uniform surface and compacted. Each lift of fill material shall not exceed six (6) inches of compacted thickness. The entire embankment fill shall be spread in layers or lifts compacted as specified.

6. The moisture range for compaction of fill shall be as specified by the design engineer and qapproved by the City or County Engineer. This moisture range shall be determined by the Standard Proctor Density Method, A.A.S.H.O. Method T-99.

7. After each lift or layer of fill material has been placed as outlined in Subparagraph 5, above, and brought to the proper moisture content, the entire area shall be compacted as follows:

   a. The compacted density of soil in fill areas shall be at least ninety-five percent (95%) of the Standard Proctor Density as determined by A.A.S.H.O. Method T-99.

   b. Granular materials, including sand and gravel, shall be compacted with a pneumatic-tired roller. Each lift shall be rolled until no further consolidation is evident.

8. Cut sections shall be scarified to a depth of six (6) inches below the subgrade elevation and compacted to the moisture and density requirements specified above for fill sections. Feeble plastic and non-plastic fine-grained material shall be removed from the right-of-way.

Utility trenches, areas around manholes, culverts, bridges, retaining walls, curbs, and other areas inaccessible by rollers shall be compacted by mechanical tampers or approved hand tampers. Water soaking or ponding (jetting) will not be permitted in street right-of-way.

F. Curb and Gutter.

1. This work shall consist of constructing air-entrained Portland Cement Concrete combined curb and gutter to the lines, grades, dimensions, and cross-sections shown on the approved plans and in accordance with this Chapter. The developer or his/her engineer may request consideration of alternate types of curb and gutter; or in the case of local residential streets, cul-de-sacs or loops with twelve (12) dwelling units or less and no expected through traffic, a request may be made to

the City or County Engineer for consideration of deleting the curb and gutter requirement on said streets, cul-de-sacs or loops.

2. Local residential streets other than those listed in Subparagraph (1) above and secondary thoroughfares (collectors) may have Type "A" curb or Type "B" curb. Primary thoroughfares (arterials), industrial streets, and commercial streets shall have Type "B" curb. At intersections, Type "B" curb shall be used for the radius and extending both ways to the extended building line of the lot. Type "A" curb will not be permitted on streets where driveway locations can be or have been determined prior to construction of the curbs.

3. Curb and gutter shall be constructed as specified in Section 810.02 of the Standard Specifications for State Road and Bridge Construction, State Highway Commission of Kansas Edition of 1973.

4. Where required, curb and gutter shall be reinforced with three (3) No. 4 reinforcing bars.

5. Type "A" curbs shall be six (6) inch mountable curb. Type "B" curbs shall be six (6) inch vertical face non-mountable type. All curbs and gutters shall be thirty (30) inches from toe to back of curb.

G. *Option A-Concrete Paved Streets.* Description: Concrete pavement shall be constructed to the thickness specified, of Portland cement concrete pavement, air-entrained (AE) as specified in Sections 502 and 503 of the Standards Specifications for State Road and Bridge Construction, State Highway Commission of Kansas, Edition of 1973, or latest revision.

H. *Option B-Plant Mix Bituminous Pavement.* Description: Plant Mix bituminous pavement shall be constructed of thickness specified, of plant mix bituminous base and surface course as specified in Sections 602, 603 and 1001.03 of the Standard Specifications for State Road and Bridge Construction, State Highway Commission of Kansas, Edition of 1973, or latest revision.

The aggregation designation and mix design shall be submitted to the City or County Engineer for approval. Unless otherwise specified, Marshall test properties of the mix shall meet the following criteria.

Minimum Stability	750 (Lbs.)
Maximum Flow	20 (1/100 Inch)
Total Voids	3—5(%)
Voids Filled	78—85(%)

I. *Minimum Length of Work.* Plans will not be approved or work accepted for less than one (1) block. All street pavements, sanitary sewer, water mains, sidewalks and all other types of public improvements must extend from an intersection to, and include, the next intersection. The only exceptions will be where the intersections are not paved at the time of passage of this ordinance or only a half (½) block is included in the subdivision.

J. *Cleaning Operation.* All catch basins, manholes, inlets and outlets and roadway surface shall be thoroughly cleaned of any accumulations of silt, debris or foreign matter of any kind, and shall be free from such accumulations at the time of final inspection.

K. *Material Tests and Certificates of Compliance.*

1. *Material tests.* When requested by the City Engineer, the contractor shall furnish test results at the contractor's expense from an approved testing laboratory. Tests may be required for any of the following:
a. Sub-grade compaction on any section of the street and compaction around culverts, bridges, retaining walls, manholes, catch basins and other locations inaccessible to rollers.

b. Aggregate for Portland cement concrete, plant mix bituminous base course, hot-mix surface, plant mix cement treated crushed aggregate base course.

c. Portland cement content and asphalt content.

2. *Certificates of compliance.* When requested by the City Engineer, Certificates of Compliance shall be submitted by the Contractor for private construction and by the Project Engineer for public construction. Certificates of Compliance shall cover materials used and construction methods used.

L. *Inspections.*

1. *Time of inspections.* During the construction of all roads, streets and alleys under the jurisdiction of the City, six (6) inspections shall be made by the City Engineer.

a. One (1) inspection shall be made during sub-grading;

b. One (1) inspection shall be made prior to installation of curbs;

c. Curb inspection prior to placing of concrete in curbs;

d. One (1) inspection of the sub-grade prior to placing base or concrete;

e. One (1) inspection shall be made upon final installation, manipulation, and compaction of the base;

f. Final inspection shall be made upon completion of the project, including surfacing, backfilling and cleanup.

Other inspections may be made as deemed necessary by the City Engineer.

2. *Approval.* Approval of the work by the City Engineer at either of the first three (3) inspections shall give the Contractor the right to proceed with the next succeeding operation, but shall in no way indicate complete approval of prior work if later inspection discloses any deficiency.

These approvals will be secured by notifying the City Engineer in ample time to allow inspection of each phase. On the final acceptance inspection of a completed street or sidewalk, the City Engineer may require a Certificate of Compliance as specified above.

M. Storm Water Runoff.

1. The developer shall submit a plan detailing how storm water runoff will be managed or controlled.

2. The developer shall provide a plan to include methods of handling stormwater runoff. Structural improvements shall be based on design criteria adopted by American Public Works Association, unless the City adopts local *Design Criteria for Stormwater Runoff Management.* These designs shall be submitted to the City or County Engineer for approval.

ARTICLE VIII. - INSTALLATION OF REQUIRED IMPROVEMENTS

SECTION 455.350: - SUBDIVISION TYPES

A. For the purposes of this Article, subdivisions shall be classified into the following types:

1. Urban subdivisions. All subdivisions ~~laying~~ for residential purposes within the City of Junction City ~~and those subdivisions in unincorporated areas~~ having or intended to have a density of ~~less~~ more than one (1) dwelling unit per twenty thousand (20,000) square foot lot; and all subdivisions or portions thereof for commercial, industrial, and public or semi-public purposes ~~(directly related to an urban residential subdivision)~~.

2. Suburban subdivisions. All other lands ~~in incorporated or unincorporated areas~~ within the City of Junction City required to be platted either by Statute or by these Subdivision Regulations.

~~B. In interpreting this Article, any time an ownership of a tract of land is split by the application of the "three-mile ring" (defined as a line drawn in a circular fashion three (3) miles from the City of Junction City), said tract shall be considered to be entirely within the three-mile ring if over fifty percent (50%) of the area of the tract lies directly within said three-mile line. If fifty percent (50%) or less of the tract lies within the ring, then the entire tract shall be considered to be outside the three-mile ring.~~

SECTION 455.360 – JURISDICTION

In setting standards and specifications not covered by this Chapter, approving engineering drawings, inspecting improvements, recommending acceptance of improvements, preparing any petition forms and establishing the amount of surety for guaranteeing the installation of such improvements ~~the following governmental units, departments, agencies or personnel~~ shall be ~~designated as~~ the ~~"appropriate jurisdiction" for the type of required improvement listed~~ responsibility of the appropriate representative of the City of Junction City, Kansas.

~~Improvement~~	~~Jurisdiction~~	
	~~City of Junction City and 3-Mile Area~~	~~Unincorporated Area of County Outside of Junction City 3-Mile Area~~
~~Roadways, alleys, curbs and gutters, sidewalks and street drainage~~	~~City Engineer~~	~~County Engineer~~
~~Water Supply Systems~~	~~City Engineer (1)~~	~~County Engineer (1)~~
~~Fire Hydrants~~	~~City Engineer (1)~~	~~County Engineer (1)~~
~~Sanitary Sewer System~~	~~City Engineer (1)~~	~~County Engineer (1)~~
~~Storm Sewer System~~	~~City Engineer (2)~~	~~County Engineer~~
~~Underground Wiring~~	~~Utility Company Involved 3~~	~~Utility Company Involved 4~~
~~Bench Marks and Monuments~~	~~City Engineer~~	~~County Engineer~~
~~Street Signs~~	~~City Engineer~~	~~County Engineer~~

~~1 With the approval of the State Board of Health and the County Health Department when required by law; and with the approval of the Sanitation Zone Officer, when applicable.~~
~~2 On major watercourses or drainage channels which may have a relationship to the drainage in the unincorporated areas, the City Engineer shall consult with the County Engineer.~~
~~3 Consultation required with the City Engineer.~~
~~4 Consultation required with the County Engineer.~~

SECTION 455.370: - REQUIRED IMPROVEMENTS

The ~~subdivider~~ developer of a proposed subdivision shall install, or provide for the installation of, the following facilities and improvements:

1. Streets, roadways, alleys, curbs, gutters and street drainage shall be installed in all subdivisions and/ or re-subdivisions. ~~The installation of street improvements shall be on the following basis and all such improvements shall be financed in accordance with Section 455.390.~~

   ~~*A. Within the City of Junction City.*~~ All streets, roadways, alleys, curbs, gutters and street drainage facilities required to be installed ~~in subdivisions which are located within the City of Junction City~~ shall be designed and constructed in accordance with the City *Engineering Design Standards* as adopted by resolution of the City Commission. ~~standards as specified in Section 455.340 Subsections (A—L).~~

   ~~a. *Within the Junction City three (3) mile area.*~~

      ~~1) All streets, roadways, alleys, curbs, gutters and street drainage facilities installed in urban subdivisions located in the Junction City three (3) mile area shall be constructed in accordance with the standards as specified in Section 455.340 Subsections (A—L).~~

      ~~2) All streets, roadways, alleys, curbs, gutters and street drainage facilities installed in suburban subdivisions located in the Junction City three (3) mile area shall be constructed in accordance with the standards as specified in Section 455.340 Subsections (B, C, D and E).~~

   ~~b. *Within unincorporated area outside of Junction City three (3) mile area.* All streets, roadways, alleys, curbs, and gutters and street drainage facilities installed in urban and/or suburban subdivisions located in the unincorporated area outside of the Junction City three (3) mile area shall be constructed in accordance with Section 455.270(J) and Section 455.340.~~

B. Sidewalks shall be required on both sides of all arterial and collector streets in both urban and suburban subdivisions. ~~in accordance with the standards set by the appropriate engineer.~~ Sidewalks shall be required on both sides of all local residential streets in urban subdivisions. The developer may request an Exception for sidewalks ~~may be deleted~~ on cul-de-sacs of less than twelve (12) residences or loop drives with less than eighteen (18) residences unless the City Commission, determines sidewalks are necessary for safety of pedestrian traffic near schools, parks or other areas of high pedestrian traffic. The developer may request an Exception to provide ~~Planning Commission may require~~ sidewalks on only one (1) ~~or both~~ sides of local streets in suburban subdivisions.

   a. ~~a.~~ Sidewalks shall be guaranteed from curb to curb of intersecting streets rather than to property lines. Sidewalks shall be constructed in the street right-of-way to a minimum width of five (5) feet, unless required larger by the City. ~~for arterial streets and four (4) feet for all other streets.~~

C. ~~Sanitary sewer.~~

   a. ~~Within the City of Junction City.~~ Sanitary sewer lines shall be installed to serve each lot created in a subdivision and/ or re-subdivision and designed per City *Engineering Design Standards* as adopted by resolution of the City Commission. ~~for such capacity as will be required to serve all upstream tributary area which is or may be developed in the future~~. Private sewer lines are prohibited. Not more than one (1) house, business building or commercial building shall be served by each service connection. Any proposed subdivision

and/or re-subdivision that seeks to establish lots not served by a sanitary sewer line shall comply with the applicable provisions of the City Code concerning private on-site wastewater treatment systems, and amendments thereto. ~~The cost of the sewer system shall be paid for in accordance with Section 455.390.~~

~~b. Within the Junction City three (3) mile area. Sanitary sewers shall be installed as required in Section 455.370 (1)(a) for all urban type subdivisions.~~

~~c. Within the unincorporated area outside of the Junction City three (3) mile area.~~

~~1) For all urban type subdivisions, the subdivider shall provide municipal type sanitary sewers as required in Subsection (3)(a) above.~~

~~2) In suburban subdivisions, individual treatment systems may be used provided lot size shall be in conformance with Section 12-404, Geary County Zoning Regulations and, further provided, that additional lot area may be required in areas suspected of having a high water table or where percolation tests indicate unfavorable soil conditions. Subdivisions will not be approved in areas unable to support individual treatment systems unless a substitute method of sewage disposal is provided as approved appropriate engineer.~~

~~d. In any of the above requirements calling for, or dependent on, action by a Governing Body or agencies or department thereof, when the Governing Body does not fulfill its obligation within a period of time, not to exceed five (5) years, determined by the Planning Commission at the time of final plat approval, then the requirements for municipal type sewer facilities shall be void and the subdivider may proceed with approved individual treatment systems.~~

D ~~Water supply systems.~~ A public water supply system shall be installed to serve each lot created in a subdivision and/ or re-subdivision. The public water supply system shall be designed and constructed ~~or its equivalent~~ in accordance with the City *Engineering Design Standards* as adopted by resolution of the City Commission. Lots being created that are not served by a public water supply system shall comply with the applicable provisions of the City Code concerning private on-site wastewater treatment systems, as amended. Water wells established within the City of Junction City shall only be permitted if permitted and constructed by the Sanitary Code of Geary County, Kansas, and amendments thereto. No water well shall be permitted to serve any home, business or industry that is also served by a public water supply system. ~~standards of the appropriate engineer shall be provided in all areas where lateral sanitary sewers are required and in all urban subdivisions. In all other areas, a water supply approved by the City of Junction City and/or the County Department of Health shall be provided. In those areas where there is a public water supply system, mains shall be of such size as to support the use of fire hydrants as required in Subsection (5) of this Section.~~

~~a. *Tracing wire.* Shall be installed on all distribution lines, dedicated fire lines and any service that is four (4) inch or larger. *"Tracing wire"* will be defined as a single, stranded 12-gauge, wet application insulated copper wire.~~

~~(1) Tracing wire shall be taped to the top of all pipes as stated in Section 455.370(4)(a) Tracing wire. The tracing wire shall be one (1) piece, installed in a continuous run between access points (tracer wire terminal boxes located either right or left of all new project fire hydrant assemblies) and connected to any existing tracer wire at ends of project to form a continuous loop. At points where wiring splices may be required, exposed ends of the tracing wire shall be securely twisted together and secured with a watertight epoxy splicing adapter to prevent separation. The spliced section shall then be securely taped to the top of the pipe.~~

(2) Contractor shall check tracing wire installation for continuity at each access point (trace wire terminal box installed adjacent to each new project fire hydrant assembly) as the project progresses and prior to compacting previously installed piping. In the event that continuity test reveals a loss of continuity, the contractor shall locate the break and repair damage prior to proceeding on with the installation of further piping and tracing wire. Upon substantial completion of the project, the complete tracing wire installation shall be checked for continuity by the appropriate inspection agency. The project will not be approved for service until such time as all continuity tests pass.

E. Fire hydrants shall be installed in all subdivisions and/ or re-subdivisions. Fire hydrants shall be designed and constructed City *Engineering Design Standards* as adopted by resolution of the City Commission.

a. Within the City of Junction City.

(1) Fire hydrants shall be provided wherever there shall be required a public water supply system. Fire hydrants shall be served by six (6) inch minimum water mains and shall be spaced at approximately five hundred (500) foot intervals.

(2) All fire hydrants shall have mechanical joint (MJ) ends for connection to six (6) inch standard ductile iron pipe. All fire hydrants shall be three-way fire hydrants and shall have a five and one quarter (5¼) inch main valve opening, two (2) two and one-half (2½) inch hose nozzles and one (1) four and one-half (4½) inch pumper nozzle.

(3) All hydrants shall meet the standards set forth in the technical specification approved by the appropriate engineer.

b. Within the Junction City three (3) mile area and the unincorporated area outside of the Junction City three (3) mile area.

(1) in accordance with the standards of the appropriate engineer, shall be provided wherever there shall be required a public water supply system.

2. F. Storm sewer system shall be installed in all subdivisions and/ or re-subdivisions. Storm sewer systems shall be designed and constructed City *Engineering Design Standards* as adopted by resolution of the City Commission. separate and independent of the sanitary sewer system, meeting all of the specifications and requirements of the appropriate engineer. Such storm system, shall be connected to any existing storm sewer system where available, of the City of Junction City, or the system of the County or to the nearest major water channel. If such connection is not available, other adequate means for discharge of such storm sewer system shall be provided by the subdivider. See Article VII, Section 455.340(M) for guidance.

G. Street signs shall be installed within all subdivisions and/ or re-subdivisions as requested by the City Engineer. Street signs of such location, type and size as shall be per City *Engineering Design Standards* as adopted by resolution of the City Commission.approved by the appropriate engineer and shall conform to the *"Manual on Uniform Traffic Control Devices for Streets and Highways".*

H. Wiring or electrical power, telephone and cable television service lines shall be placed underground in all subdivisions within the City of Junction City that are approved from and after November 1, 2013 the date of passage of this Section provision. The developer may request an Exception waiver from this requirement if physical conditions of the land in question make underground installation infeasible. Such request shall be accompanied by a report from the responsible public utility relating to said request and applicable justification for the Exception.stating per linear foot cost differential between the average cost for installation of underground utilities and the estimated cost at the subject site. The Planning Commission shall review the request and make a recommendation to the Governing Body.

Underground installation of wiring or electrical power, telephone and cable television service lines shall not be required in flood-plains, drainage easements, major drainage ways or other areas where there is frequently standing water.

Electric distribution or transmission lines with capacities of 3,000 KVA or more shall not be required to be installed underground.

No building permit for new construction of a principal structure shall be issued where underground utilities are required until the utility companies involved have certified that necessary utility lines for that property have been installed or have approved commencement of construction prior to installation of the utility lines.

Any overhead lines in service prior to the effective ~~adoption~~ date of this provision stated above shall not be affected. The ~~Construction and~~ installation of underground utilities shall be per the City *Engineering Design Standards* as adopted by resolution of the City Commission ~~occur after sanitary sewer lines, if any, are in place.~~ All such construction and installation of the utilities noted in this subsection shall be under contract with the applicable utility provider.

Utility lines will be designed in the rear of the lots where allowable by grade, ~~and~~ drainage and per City *Engineering Design Standards* as adopted by resolution of the City Commission.

l. Monuments and bench marks shall be ~~set~~ installed per City *Engineering Design Standards* as adopted by resolution of the City Commission. ~~at all block corners, angle points, points of curves in streets, street intersections, and at intermediate points as shall be required by the appropriate engineer. Monuments falling in street right of way shall be set in concrete after paving is completed. Bench marks may also be required as determined necessary by the appropriate engineer. Monuments and bench marks shall be of such material, size and length as may be approved by the appropriate engineer.~~

~~3. Public improvements to be provided for in certain circumstances.~~

~~a. Where subdivisions are platted in the unincorporated areas outside the City of Junction City, with the minimum lot size of two (2) acres with the intention of subsequently providing either a municipal type sewage collection and treatment or municipal type water distribution, the Planning Commission will require easements on all lot lines and sufficient area be dedicated to the public for later construction of sewage treatment facilities or water treatment facilities. The preliminary plat shall be reviewed by the appropriate engineer for conformance to these requirements, and it shall be the responsibility of the developer to provide assurance that a proper amount of land has been dedicated for future public sanitation facilities, although specific construction plans and specifications will not be required.~~

~~b. In said subdivisions which are platted in accordance with paragraph 12-404 of the Geary County Zoning Regulations, the developer shall allow and shall not protect the formation by the County Commission of public improvement benefit districts encompassing the entire area of the subdivision, for the purposes of installation of public sanitation systems, either sewer or water. The County Commission may require the formation of said benefit districts prior to filing of the final plat of the subdivision. If so, a note shall be placed on the final plat indicating that the lots are subject to said benefit district. The number and date of the County Commission resolution creating said benefit district will also be shown on the final plat.~~

~~a. All final plans be reviewed, and accepted by City staff prior to submittal to other agencies, i.e., , KDHE. City staff has up to thirty (30) days to review and approve said plans.~~

J. ~~Final grading plans.~~ The developer shall submit a plan detailing final grading plans for the entire development per City Engineering Design Standards as adopted by resolution of the City Commission. ~~The City is not responsible for the costs associated with design or final grading of areas outside the right of way.~~

SECTION 455.380: - EXCEPTIONS FOR EXISTING IMPROVEMENTS

A. Where the proposed subdivision is a re-subdivision or concerns an area presently having any or all required improvements set out in Section 455.370, and where such improvements meet the requirement of said Section and are in good condition as determined by the appropriate representative of the City ~~appropriate engineer~~, no further provision need be made by the subdividers to duplicate such improvements. However, where such existing improvements do not meet the requirements of Section 455.370, the ~~subdivider~~ Developer shall provide for the repair, correction, or replacement of such improvements so that all improvements will then meet the aforesaid requirements of Section 455.370.

B. Where the proposed subdivision is a re-subdivision or concerns an area presently abutting or containing any existing public street of less than the minimum required right-of-way width ~~or roadway width~~, the plat ~~land~~ shall ~~be~~ dedicated ~~additional~~ right-of-way, so as to provide a minimum street right-of-way width the per City *Engineering Design Standards* as adopted by resolution of the City Commission. ~~established by this Chapter and/or Planning Commission policy.~~

C. ~~Where t~~The ~~subdivider of such~~ proposed subdivision is a re-subdivision or concerns an area presently abutting or containing an existing public street of less than the minimum required pavement with, the Developer of such proposed subdivision shall provide an additional street ~~roadway~~ pavement width ~~meeting the minimum standards~~ per City *Engineering Design Standards* as adopted by resolution of the City Commission. ~~set by this Chapter and the appropriate engineer. The appropriate engineer shall determine what adjustment to make where the aforesaid widenings merge with existing streets which are of smaller width at the boundary of such proposed subdivision.~~ The ~~appropriate engineer~~ Developer may request an Exception, subject to approval of the City Commission, to reduce the minimum street ~~roadway~~ width required by this Chapter to match an existing street ~~roadway~~ system if the extension of such street ~~roadway~~ is already improved at each end of the street ~~roadway~~ adjoining said ~~in the~~ subdivision or ~~and the roadway in the~~ re-subdivision, and the street adjacent to the subdivision or re-subdivision ~~to be of reduced width~~ is two (2) blocks or less in length. ~~The appropriate engineer may also require lanes to be painted on such widened streets designated driving and parking areas. The foregoing provisions requiring the widening of pavement may be waived by the Planning Commission when the length of such pavement is less than one hundred thirty five (135) feet.~~

SECTION 455.390: - AGREEMENT FOR THE INSTALLATION OF IMPROVEMENTS

~~A. *Requirements Prior To Approval Of Final Plat.*~~

~~1. Prior to the approval of a final plat by the Junction City Geary County Metropolitan Planning Commission for any subdivision located in Junction City or in any area where improvements are required to be installed to City standards, the subdivider shall enter into a written agreement with the City of Junction City, Kansas, in which all required improvements are specified, together with the method of construction and provisions for payment of the cost thereof. In all cases where the subdivider does not petition the City of Junction City, Kansas, for the construction of public improvements, the subdivider shall file prior to the approval of the final plat performance and maintenance bonds in an amount equal to one hundred percent (100%) of the estimated construction cost of all improvements required by Section 455.370. In the event that estimated construction costs are not established, the engineer~~

~~listed having jurisdiction in Section 455.360 shall set the amounts of the performance and maintenance bonds.~~

~~2. Prior to the approval of a final plat by the Junction City - Geary County Metropolitan Planning Commission for any subdivision located in the unincorporated area of Geary County, the subdivider shall enter into a written agreement with Geary County, Kansas, in which all required improvements are specified, together with the method of construction and provisions for payment of the cost thereof. In all cases where the subdivider does not petition Geary County, Kansas, for the construction of public improvements, the subdivider shall file prior to the approval of the final plat performance and maintenance bonds in an amount equal to one hundred percent (100%) of the estimated construction cost of all improvements required by Section 455.370. In the event that estimated construction costs are not established, the engineer listed having jurisdiction in Section 455.360 shall set the amounts of the performance and maintenance bonds.~~

~~B. The developer's cost shall include one hundred percent (100%) of the cost of the engineering, plans and specifications, supervision and inspection of the project including, but not being limited to, the cost of the staking of the project plus one hundred percent (100%) of the cost of any other engineering costs concerning the project which the City may incur. The City will add to the project an amount estimated to reimburse the City for its administrative costs equal to eight percent (8%) of the contract cost of the project in addition to the above engineering expenses, if the developer petitions the City to provide the improvements. The developer shall provide a method of financing for the required improvements prior to the beginning of the construction of any private improvements in said addition.~~

~~C. The developer shall submit to the City firm contracts providing for the construction and completion, within a reasonable time of the public improvements as specified by the engineer's plans and specifications. As an alternate, the developer may petition the City to provide said improvements, as provided by law.~~

A. Financing.

1. Subdivision Improvements: A breakdown of anticipated costs for all improvements required within a proposed subdivision or re-subdivision, and a method for financing said proposed improvements shall be submitted to the City representatives with the proposed Final Plat. This shall be accomplished by filing a Development Agreement or a Benefit District Petition, and shall be required for all subdivisions of land, except for actions which require no new internal public improvements. The City Commission shall have sole responsibility to accept or reject the Development Agreement or Benefit District Petition. Financing methods may include, but are not limited to, the following:

(a) Petition for Establishment of a Benefit District. The City Commission may elect to not permit the establishment of a Benefit District under Kansas law for the financing of the internal improvements of a proposed subdivision or re-subdivision. If the City decides to permit the establishment of a Benefit District, the percentage split of costs for the internal public improvements between the developer and the City-at-large shall be based on the policy established by the City Commission. The City may decide not to participate in Benefit Districts that do not comply with the Capital Improvements Program or those which are inconsistent with the Comprehensive Plan.

(b) Guarantee of Public Improvements: As noted herein, the developer shall provide the City Engineer with all calculations and information needed to estimate the costs of said internal public improvements. These costs shall be verified by the City Engineer or his/her representative. The developer shall be required to guarantee all costs of all required improvements of said subdivision or re-subdivision by in a manner acceptable

by the City Commission. The duration of the guarantee shall be until such time as the improvements are completed, inspected and accepted by the City.

(c) Alternatives: Financing methods may include cash or collateral, Escrow Accounts, Property Escrow Accounts, or any other guarantee the City Commission shall deem acceptable.

2. Establishment of Developer's Costs. The developer's cost shall include one hundred percent (100%) of the cost of the engineering, plans and specifications, supervision and inspection of the project including, but not being limited to, the cost of the staking of the project plus one hundred percent (100%) of the cost of any other engineering costs concerning the project which the City may incur.

C. Unless financed by the establishment of a Benefit District, the developer shall submit to the City firm contracts providing for the construction and completion, within a reasonable time, of the public improvements as specified by the engineering plans and specifications approved for said subdivision and/or re-subdivision.

D. The following are considered minimum public improvements:

1. Installation of eight (8) inch sewer line and service connection to all adjacent lots;

2. Extension of eight (8) ~~six (6)~~ inch water distribution mains and service connections to all adjacent lots ~~in accordance with the City's minimum specifications~~;

3. Installation of curb and gutter and backfill;

4. Installation of paving ~~in accordance with the City's minimum specifications;~~

5. Installation of storm sewers or surface drainage ~~where required by the City~~; and

6. Installation of sidewalks ~~according to the City's minimum specifications.~~

All public improvements shall be designed and completed in accordance the City *Engineering Design Standards* as adopted by resolution of the City Commission. ~~with plans and specifications approved by the City Engineer and filed in the City Engineer's office. All public improvements will be inspected by the City Engineer or his/her duly authorized representative.~~ The developer shall pay the entire cost of the public improvements, unless developer petitions the City to provide them, in which case, the City ~~shall~~ may consider participation ~~pay ten percent (10%) and the developer ninety (90%)~~ of the cost of such public improvements, should the City Commission determine it to be in the best interest of the City.

~~E.~~ Prior to the approval of the final plat by the City of Junction City-Geary County Metropolitan Planning Commission for any subdivision located in the City or in any area where improvements are required to be installed to the City *Engineering Design Standards*, the Developer shall file performance bonds, or provide other acceptable guarantees, in an amount equal to hundred percent (100%) of the estimated construction cost of all improvements required by Section 455.370. The performance bond shall not be required if the improvements are financed by the establishment of a Benefit District; provided, however, all guarantees required by the City Commission in establishment of said Benefit District shall be provided to the City. ~~commencement of any work whatsoever, whether public funds are involved or not, the developer shall file with the City~~ Manager in conformance with ~~Section 455.390(A) the following:~~

~~1. A one year's maintenance bond in a form prescribed by the City, which bond must be executed by a surety company licensed to do business in the State of Kansas and acceptable to the City. Said bond shall inure to the benefit of the City for the public improvements; and~~

Where the developer or the contractor is a non-resident of Geary County, either or both shall file an appointment of a process agent on a form prescribed by the City with the Clerk of the District Court of Geary County, Kansas, as provided by Section 16-113 of the Kansas Statutes Annotated, as amended, and amendments thereto.

F. Should the City require street improvement wider than thirty-one (31) feet back-to-back of curb or sanitary sewer lines larger than eight (8) inches, or water lines larger than eight (8) ~~six (6)~~ inches, or storm sewers larger than thirty (30) inches, the Development Agreement required by these Regulations shall provide the manner in which the added expenses associated with the larger improvements shall be addressed. The City may require the developer to cover said costs if the conditions and circumstances of the subdivision and/or re-subdivision warrant. ~~developer and his/her engineer shall meet with the City Commission and resolve these differences, and settle responsibility~~ for ~~payment of the of same, by agreement in writing, prior to the final acceptance of the plat.~~

G. Whenever property not adjacent to a boundary of the City is annexed by the City, and improvements are made for services to be provided thereto, such annexed property shall be assessed for improvement on the above-stated basis, plus an amount reasonably chargeable to the property as a pro-rata share of the cost of extension of such services, and the remainder of the cost of improvements placed between the existing City boundary and the newly annexed property shall be assessed to and paid by the City at large. At such time as the intervening property is annexed to the City and the owners or developers thereof desire said services, a hook-on fee or service charge will be paid by the owner or developer of said intervening property equal to the amount assessed to and paid by the City at large for the cost of said improvements, including interest through the maturity schedule of the bonds. Said hook-on charge or service fee shall be paid prior to the approval of the final plat of the intervening land. The hook-on fee or service charge shall be based on an amount that would be assessed to other subdivisions for the same services. The application of this provision shall be solely at the option of the City ~~appropriate Governing Body~~.

H. The Development Agreement mentioned in subsection (A) above, shall run with the land and shall extend to and be binding upon all successive owners of the real estate to the same extent as though such owners had executed the contract personally, and shall be binding upon the heirs, executors, administrators and assigns of the developer. The Development Agreement shall not be construed as granting any right or privilege to the developer which the City would not otherwise be required to perform by law, and it shall not be construed as requiring the City to perform any act which would not otherwise be a legal obligation of the City.

I. Defaulting. The City Commission may, upon advice of the City Engineer, find that the developer is in default of the Development Agreement. Such finding shall occur at a regularly scheduled meeting of said City Commission. Two (2) weeks prior to such scheduled meeting, the developer shall be notified in writing of possible default proceedings.

Defaulting results from:

1. Improper construction standards and specifications.
2. Failure to install agreed upon improvements.
3. Construction of improvements not according to agreed upon time schedule, resulting in unexpected or avoidable delays.
4. Other financial and/or contractual conditions which might lead to the developer being unable to complete the agreed upon improvements.

At the meeting of the City Commission, the developer shall be given the opportunity to rebut findings of default. The City Commission may find the developer not in default, extend the time limit, or:

5. Should the City Commission find the Development Agreement terms to have been violated, it may liquidate the improvements guarantee, in whatever form it takes, and apply the proceeds of this guarantee to the construction of the improvements set out in the Development Agreement.
6. Should the proceeds of the guarantee not be sufficient to cover the costs of said improvements, the City Commission may assess to the developer, property owners, or both, the construction costs of the improvements that exceed the amount provided by the developer. This may take the form of a lien against the property covered in the Development Agreement.
7. Should the proceeds of the guarantee exceed the actual cost of the improvements, and any cost incurred in the default procedures, the City shall return the unexpended balance to the individual named on the Development Agreement as the one having secured the guarantee.

J. Guarantee Release. When all improvements have been completed and have been inspected, approved and accepted, the City shall authorize the release of the performance guarantee.

ARTICLE IX. - IMPROVEMENT PROCEDURES

SECTION 455.410: - SUBMISSION OF REQUIRED AGREEMENTS

If ~~Agreements for~~ the ~~Installation of~~ ~~i~~Improvements~~, as~~ required are addressed with a Development Agreement as required in Section 455.390 ~~is to be entered into,~~ the ~~subdivider or~~ developer shall so indicate at the time the preliminary plat is filed. If these proposed plat is ~~agreements are~~ approved ~~by the City Commission,~~ three signed copies by the developer shall be submitted to the City when the final plat is ~~filed.~~ is presented for final consideration.

SECTION 455.420: - FINAL IMPROVEMENT PLANS

The ~~subdivider or~~ developer shall have plans and engineering drawings, complete with other engineering information, for all required improvements within a subdivision and/or re-subdivision prepared in conformance with the requirements of the City *Engineering Design Standards* ~~as specified in Section 455.430, prepared for required improvements~~ by a licensed ~~registered~~ professional engineer, licensed within the State of Kansas. ~~The~~ Ccomplete plans, drawings, and other engineering information, the number determined by the City shall be submitted per City *Engineering Design Standards* as adopted by resolution of the City Commission, ~~in duplicate to the appropriate engineer~~ to the City Engineer within ~~at least~~ thirty (30) days ~~prior to the requested~~ of the approval date of the final plat. The developer may request an extension of the time to submit the plans; however extensions shall not be granted beyond an additional thirty (30) days. Failure to ~~submit these plans, drawings, and other information shall be considered an automatic extension of or a waiver by the subdivider of any time limitation for plat approval.~~ provide the plans required in this section shall constitute a violation of the Development Agreement and shall void said Agreement. No authorization for construction of any of the improvements shall be permitted by the City until a Development Agreement is reestablished and all guarantees fully funded in conformance to these regulations and all other applicable rules, regulations, codes and requirements of the City.

SECTION 455.430: - CONTENT OF ENGINEERING DRAWINGS

Engineering plans, drawings, and other engineering information shall be submitted in accordance with the City *Engineering Design Standards* as adopted by resolution of the City Commission.~~contain the following data and information and shall conform to the following requirements:~~

~~1. All plans, profiles, and details of proposed improvements shall be on standard plan and profile sheets or other appropriate sheets. Each sheet of the drawings shall be on twenty-four (24) inch by thirty-six (36) inch sheets with an appropriate border and a title block in the lower right-hand corner. The title~~

block shall contain at least the name of the subdivision, a brief description of the information shown on the individual sheet, the name and address of the developer, the name, address, and professional seal of the engineer, the date of the original drawing, and the date of any revisions to the drawing. Plans and profiles shall be shown to a horizontal scale of one (1) inch equals one hundred (100) feet and a vertical scale of one (1) inch equals ten (10) feet, or a horizontal scale of one (1) inch equals fifty (50) feet and a vertical scale of one (1) inch equals five (5) feet. The scale and north point shall be clearly indicated on each sheet.

If the drawings consist of three (3) or more sheets there shall also be an appropriate cover or title sheet showing the entire subdivision at a suitable scale, the subdivision name, a brief description of the nature of the drawings, an index to the drawings, and other applicable information.

2. Plans, profiles, and details for roadway and sidewalk construction shall show profiles of the existing topography elevations, profiles of proposed sidewalk, curb, and street centerline elevations, intersection control elevations, paving geometrics, typical cross-sections and other data required for staking and construction. Construction specifications and cost estimates shall be submitted with the plans.

3. Plans, profiles, and details for storm sewer and storm drainage improvements shall show existing profiles, proposed flowline profiles, grades and elevations, manhole details, drainage structure details and inlet details, plus any other data necessary for staking and construction. Construction specifications and cost estimates shall be submitted with the plans. Copies of engineering calculations may also be required to be submitted for review.

4. Plans and details of the proposed water distribution system and water supply facilities shall show all information necessary for review and construction of the systems, including line sizes, fire hydrant locations and valve locations. Construction specifications and cost estimates shall be submitted with the plans. Copies of engineering calculations may also be required to be submitted for review.

5. Plans, profiles, and details for sanitary sewer systems and sewage treatment facilities shall show line sizes, grades, flow line elevations, and other information necessary for plan review and construction. Construction specifications and cost estimates shall be submitted with the plans. Copies of engineering calculations may also be required to be submitted for review.

6. Grading plans for all lots and tracts in the subdivision requiring fill of more than thirty (30) inches showing the existing ground contours, proposed finish ground contours, and drainage shall be submitted. Construction specifications and cost estimates shall be submitted with the plans.

7. When unusual site conditions exist the Planning Commission may require additional plans, drawings, and specifications as may be necessary for adequate review of the proposed improvements.

8. All plans shall be based on USGS datum. Bench mark descriptions and elevations shall be shown on the plan sheets.

9. All plans for underground wiring shall be prepared by or at the direction of the agency involved.

10. City staff shall approve all drawings prior to bidding or submittal to regulating agencies. Prior to bidding, all required permits shall be received by the City.

SECTION 455.440: ~~– REVIEW OF PLANS~~

The appropriate engineer or agency responsible for determining specifications and standards referred to in Section 455.370 shall review all engineering drawings in order to determine whether such drawings are consistent with the approved preliminary plat and comply with the design standards. If such drawings are consistent and so comply, the reviewing official shall forward to the Planning Commission a notice that

~~they so conform and comply. In the event that the drawings do not so conform or comply, the reviewing official shall notify the subdivider of the specific manner in which such drawings do not so comply, and the subdivider may then correct such drawings. If such drawings are not corrected, the reviewing official shall forward to the Planning Commission a notice as to the items of non-conformity or non-compliance.~~
Reserved for future use.

SECTION 455.450: - APPROVAL BY PLANNING COMMISSION

The Planning Commission shall approve a final plat only ~~when the City and/or County Engineer has approved the plans and engineering drawings and the agreement for improvements, if required, has been filed with the City Clerk appropriate engineer.~~ after confirmation the method of financing the improvements has been identified and, if applicable, the Developers Agreement for said improvements has been filed with the City.

SECTION 455.460: - CONSTRUCTION OF IMPROVEMENTS

No improvements shall be constructed nor shall any work preliminary thereto be done until such time as a final plat and the engineering drawings accompanying it shall have been approved and there shall have been compliance with all of the requirements relating to the agreement specified in Section 455.390 of this Chapter. City Engineer ~~staff~~ shall approve all drawings prior to bidding or submittal to regulating agencies. Prior to bidding, all required permits shall be received by the City Engineer.

SECTION 455.470: - INSPECTION

All improvements constructed or erected shall be subject to inspection by the City Engineer ~~appropriate engineer or official responsible for setting and enforcing the applicable design and construction standards of the required improvements.~~ The cost attributable to all inspections required by this Section ~~regulation~~ shall be charged to and paid by the subdivider. Before any required inspections take place, the subdivider shall ~~may~~ be required to post a deposit with the City ~~such official or such agency entrusted to keep such security for the official~~,to cover the cost of such inspections. Inspections shall be completed per the *City Engineering Design Standards* as adopted by resolution of the City Commission ~~The subdivider shall give at least forty-eight (48) hours written notification to such official prior to the performance of any of the following work:~~

~~1. All phases of roadway and sidewalk construction.~~

~~2. All phases of construction including, but not limited to, water lines, sanitary sewer lines, storm sewer, underground wiring and other required improvements.~~

SECTION 455.480: - ENGINEERING REVIEW, INSPECTION AND ADMINISTRATIVE FEES.~~INSPECTION PROCEDURES~~

~~After notice is received as specified in Section 455.470, the official designated in Section 455.470 may conduct an on-site inspection as generally specified in Section 455.340(L) to determine that the work complies with the approved engineering plans and specifications. If in the opinion of such official, such work does not comply with such final drawings and specifications, he/she shall have authority to order that all such work shall be terminated until such time as necessary steps are taken to correct any defects or deficiencies. Upon the correction of such defects or deficiencies, the subdivider shall again notify the official as provided in Section 455.470.~~

~~SECTION 455.490: - FINAL INSPECTION~~

Fees shall be charged for review of site plans, plats, land division other than public & private improvements, field inspection of construction by the City as set forth by resolution of the City Commission.

The developer shall pay to the City at the time the plans are submitted for review, a nonrefundable fee in the amount as set forth by resolution of the City Commission, of the cost (estimated cost to be used, but to be adjusted to final actual costs after final plan approval) of the proposed utility, improvement and/or structures to defray the City's cost of engineering review, planning and recording on City's records the proposed utility, improvement and/or structures. The developer shall pay to the City an additional fee to reimburse the ordinary cost of the City's inspection of construction. The developer shall deposit with the City, prior to start of construction, an amount of money for inspection services as set forth by resolution of the City Commission. In the event that the cost of inspection is greater than the amount deposited, the developer shall deposit additional moneys. In the event that the cost of inspection is less than the amount deposited, the excess shall be refunded to the developer.

Fees for City Attorney review of plats, easements and/ or agreements shall be as set forth by resolution of the City Commission and shall be paid by the developer.

~~Upon completion of all improvements within the area covered by the final plat, the subdivider shall notify the official designated in 455.470, who shall thereupon conduct a final inspection of all improvements installed. If such final inspection indicates that there are any defects or deficiencies in any such improvements as installed, or if there are any deviations in such improvements as installed from the final engineering plans and specifications, he/she shall notify the subdivider in writing of such defects, deficiencies, or deviations and the subdivider shall, at his/her sole cost and expense, correct such defects or deviations within six (6) months of the date of notification. When such defects, deficiencies or deviations have been corrected, the subdivider shall notify the official that the improvements are again ready for final inspection.~~

SECTION 455.500: - REPORT TO PLANNING COMMISSION AND GOVERNING BODY

The City Engineer upon ~~If a~~ final inspection indicates that all improvements as installed contain no defects, deficiencies, or deviations, ~~within ten (10) days~~ from the completion of such inspection, the City Engineer ~~official~~ shall certify to the City Commission ~~Planning Commission, the Governing Body~~, and utility that all improvements have been installed in reasonable conformity with the engineering plans and specifications accompanying the final plat.

SECTION 455.510: - "AS BUILT" DRAWINGS

Upon completion of the work, or any phases thereof, the developer producing "as-constructed" construction plans for said work shall furnish to the City, per the City *Engineering Design Standards* as adopted by resolution of the City Commission ~~two (2) twenty-four (24) inch by thirty-six (36) inch print copies, to scale, and one (1) copy in a drawing file format, acceptable to the City and County, on CD~~ of the "as built" work to the City ~~and/or County.~~

SECTION 455.520: - MONUMENTS

All required monuments disturbed, destroyed, obliterated, or lost during construction shall be replaced upon completion of the work by the developer or his/her contractors at the cost of the developer.

SECTION 455.530: - ACCEPTANCE OF IMPROVEMENTS

Upon receipt by the City Commission ~~Governing Body~~ of the notification ~~certificate~~ of the City Engineer ~~appropriate official~~ that all improvements have been installed in reasonable conformity with the approved engineering drawings and in reasonable conformity with the requirements of this Chapter and all other applicable Statutes, ordinances, and regulations, that all *"as built"* drawings have been furnished as required and that all survey monuments are in place, the City Commission ~~Governing Body~~ will thereupon, by resolution, formally accept such improvements. The developer shall file a two-year Maintenance Bond in a form prescribed by the City, which bond must be executed by a surety company licensed to do business in the State of Kansas and acceptable to the City. Said bond shall inure to the benefit of the City for the quality and initial maintenance of all public improvements installed for the subdivision and/or re-subdivision. At the conclusion of the two-year period covered by the maintenance bond, the City Engineer shall inspect all the improvements of the subdivision and/or re-subdivision and, if determined to be acceptable to the standards established by the City for said improvements, shall become the property of the City of Junction City and the developer shall be released of all responsibilities thereto. The improvements shall become the property of the City of Junction City ~~Governing Body~~ involved. The City of Junction City ~~Governing Body~~ may refuse to issue building permits ~~at any time~~ for a subdivision until the ~~in which~~ improvements have been declared complete and the required Maintenance Bond has been provided to the City ~~have not been formally accepted~~.

ARTICLE X. – EXCEPTIONS, PLAT DESIGN ADJUSTMENTS, PLANNED DEVELOPMENTS ~~APPEALS~~, WAIVERS AND VARIANCES

SECTION 455.540: - EXCEPTIONS ~~APPEALS—~~IN GENERAL

~~The subdivider of a proposed subdivision may appeal decisions made in the enforcement of this Chapter by the Administrator to the Planning Commission; by the Planning Commission to the Governing Body of the appropriate jurisdiction for streets as established in Article VIII, unless otherwise provided for in this Chapter. Any such appeal shall provide a hearing de novo. In the event the Governing Body sustains the Planning Commission, the action of the Planning Commission shall be final, except as otherwise provided by law. If the Governing Body overrules the Planning Commission, the Governing Body shall make its decision, in writing, stating the reason therefor and, except as provided in Section 455.550, return such decision and plat to the Planning Commission for reapproval as required by law.~~ Except for actions concerning Planned Developments as noted in Section 455.580 herein, the developer of a proposed subdivision may request an exception to any required development standard and/or guarantee as provided herein.

SECTION 455.550: - EXCEPTIONS FROM REQUIRED ~~APPEALS ON~~ IMPROVEMENT STANDARDS AND/OR STANDARDS

~~Any appeal as to the approval of standards, or plans and engineering drawings in connection with required improvements shall be directed to the Governing Body, and that action shall be final.~~ Any request for an exception to the installation, standards, or plans and engineering drawings in connection with required improvements shall be directed to the City Commission, and the action of the City Commission on said request shall be final. The proof of the need to grant an exception is solely on the developer and must show the improvements and/or standards are not technically feasible for the subdivision and/or re-subdivision in question.

SECTION 455.560: - EXCEPTION FROM ~~WAIVER OF~~ REQUIRED IMPROVEMENTS OR GUARANTEES OF INSTALLATION OF SAME

~~Any waiver of the required improvements may be made only by the Governing Body on a showing that such improvement is technically not feasible.~~ Any request for an exception from the required guarantees for improvements in a subdivision and/or re-subdivision shall be directed to the City Commission, and the action of the City Commission on said request shall be final. The proof of the need to grant an exception is solely on the developer.

SECTION 455.570: - PLAT DESIGN ADJUSTMENTS ~~VARIANCES~~

~~In cases in which there is unwarranted hardship in carrying out the literal provisions of this Chapter as to design criteria, e.g., lot width, lot depth, block length, etc., the Planning Commission may grant a variance from such provision.~~

1. ~~An application for a variance shall be made to the Administrator which shall transit the application to the Planning Commission. The Planning Commission shall give the applicant and any other interested person an opportunity to be heard with respect to the proposed application for a variance.~~

2. ~~The Planning Commission shall not grant a variance unless it shall find that the strict application of this Chapter will create an unwarranted hardship, and unless the proposed variance is in harmony with the intended purpose of this Chapter and that the public safety and welfare will be protected.~~

3. ~~Variances permitted under the provisions of this Article shall not include variances from the requirements of making improvements required in Article IX, unless approved as provided for in Section 455.560, the standards of specifications thereof, nor from the provisions of the Zoning Ordinances of this City, except as to variances for minimum lot width and/or area requirements. Consideration of an application for a variance pursuant to this Article X does not relieve the applicant from the necessity of proceeding under the applicable provisions of any other regulations (including zoning regulations) of the City or County relating to variances~~.

In cases in which there is unwarranted hardship in carrying out the literal provisions of the Zoning and/or Subdivision Regulations in the design of the plat with respect to lot width, lot depth, block length, or other plat design issues, the Planning Commission may grant an adjustment from such provision in the approval of the plat of said subdivision and/or re-subdivision. The request must be identified in the preliminary platting process, unless the platting is authorized to go to final plat approval without a preliminary plat. The Planning Commission shall not grant an adjustment unless it shall find that the strict application of the Zoning and/or Subdivision Regulations will create an unwarranted hardship, and unless the proposed adjustment is in harmony with the intended purpose of the Zoning and/or Subdivision Regulations and that the public safety and welfare will be protected.

Adjustments permitted under the provisions of this Article shall not include adjustments or exceptions from the requirements of making improvements required herein, unless approved as provided for in Section 455.560, the standards of specifications thereof, nor from the provisions of the Zoning Regulations of the City, except as to adjustments for minimum lot width and/or area requirements. Consideration of an application for an adjustment pursuant to this provision does not relieve the applicant, or any future owner of the applicable lot or property in question, from the necessity of proceeding under the applicable provisions of any other rules, regulations, or codes, including Zoning Regulations of the City, relating to variances.

SECTION 455.580: - EXCEPTIONS ~~VARIANCE~~—PLANNED UNIT DEVELOPMENT

When a plat or subdivision is ~~prepared~~ proposed in connection with a planned unit development authorized by ~~any legally adopted~~ the Zzoning Rregulations of the City, ~~regulating the same area, then~~ the Planning Commission may vary the design standards contained in the Zoning/ or Subdivision Regulations ~~this Chapter~~ to such extent as may be necessary to permit the preparation of a planned development in accordance with the standards, conditions and restrictions of such Zzoning Rregulation. In said approval process, a Development Agreement may be established that modifies and/or adjusts the improvement requirements within said planned development. All actions concerning proposed planned developments shall be subject to the approval of the City Commission.

TITLE V, BUILDING AND CONSTRUCTION,

CHAPTER 500. ADMINISTRATION

SECTION 500.010 POLICY ESTABLISHED

It is by the City Commission ~~Governing Body~~ of the City of Junction City, Kansas, hereby determined and declared that the safety, welfare, health and comfort of the inhabitants of the City of Junction City require the adoption of minimum design standards and regulations for the design, construction, location, alteration, repair, equipping and maintaining of developments, improvements, buildings and structures within said City and for the installation of plumbing, gas fittings, mechanical and electrical wiring in such structures and the attachment of appliances and fixtures therein and thereto.

SECTION 500.210 CREATION OF ENFORCEMENT AGENCY

The Building and Codes ~~Enforcement~~ Department is hereby created and the official in charge thereof shall be known as the Code Administrator.

SECTION 500.250 GENERAL, ENFORCEMENT

The Code Administrator is hereby authorized and directed to enforce the provisions of this Chapter for buildings and structures within the City. The City Engineer and Zoning Administrator shall still have authority and enforcement of Chapters and Sections under each jurisdiction. The Code Administrator shall have the authority to render interpretations of this Chapter and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this Chapter. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this Chapter.

SECTION 500.260 APPLICATION AND PERMITS

The Building and Codes ~~Enforcement~~ Department shall receive applications, review construction documents and issue permits for the erection, and alteration, demolition and moving of buildings and structures, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this Chapter. The City Engineer and Zoning Administrator shall receive applications, review construction documents and issue permits under each authority and enforcement of Chapters and Sections under their jurisdictions (ex. Land Use, Engineering Design Standards, etc.).

SECTION 500.450 PERMITS, FORMS, ENFORCEMENT

A. The Code Administrator shall prepare and supply all application forms relating to the granting of permits required under this Title relating to buildings, plumbing, gas fitting, mechanical, electrical wiring or any other related construction. Such forms shall give the adopted Code applicable to such application and permit, stating that the permit is made in accordance with the provisions of said Code requiring such permit and that the proposed construction or work will be done in accordance with terms of said Code. All such applicable Codes shall be made available to the applicant as provided in this Title. The City Engineer and Zoning Administrator shall receive applications, review construction documents and issue permits under each authority and enforcement of Chapters and Sections under their jurisdictions (ex. Land Use, Engineering Design Standards, etc.).

~~SECTION 500.480 USES OF RIGHTS-OF-WAY~~

~~The following rules and regulations concerning use and encroachment on dedicated rights-of-way are hereby established.~~

~~1. Unlawful use of dedicated rights-of-way or easements. No person, firm or corporation shall construct any building or structure of any kind or nature whatsoever or plant any trees, shrubbery or vegetation upon, over or under any area which has been or which may hereafter be dedicated to the City of Junction City, Kansas, or to the public as a power, electric, sewer, water, telephone, gas line, public utility easement or right-of-way. Driveways, fences and lawn sprinkler systems may be constructed in, on and/or across easements subject to obtaining proper permits from the City for such construction, and subject to the provisions stated below.~~

~~2. Owner liable for cost of removal or encroachment on right-of-way. Any person, firm or corporation who shall hereafter construct or erect any building, structure, fence, driveway or lawn sprinkler system, or plant any trees or vegetation in dedicated public right-of-way and/or dedicated utility easement shall be deemed to have done so at their own risk and shall be liable for the cost of removal of the same in the event it is necessary to make any authorized use or excavation of such area for any purpose for which the same were dedicated to the public use. Neither the City of Junction City, Kansas, nor any other person, firm or corporation which may be lawfully making use of the said right-of-way or easement shall be liable to any such person claiming damages for the removal of any building, structure, driveway, fence, lawn sprinkler system, trees or vegetation from such rights-of-way or easements.~~

SECTION 500.560 SUBMITTAL DOCUMENTS

Construction documents, statement of special inspections and other data shall be submitted in the number and size for each type of project/ development ~~four (4) or more sets~~ with each permit application (Building and Engineering Plans). The

construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the Code Administrator, City Engineer, and Zoning Administrator are ~~is~~ authorized to require additional construction documents to be prepared by a registered design professional. Exception: The Code Administrator is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that review of construction documents is not necessary to obtain compliance with this Chapter.

SECTION 500.610 SITE PLAN

The construction documents submitted with the application for permit shall be accompanied by a site plan, submitted per the City Engineering Design Standards as adopted by resolution of the City Commission. ~~showing to scale the size and location of new construction and existing structures on the site, distances from lot lines, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and design flood elevations; and it shall be drawn in accordance with an accurate boundary line survey.~~ In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The Code Administrator is authorized to waive or modify the requirement for a site plan when the application for permit, buildings and structures, is for alteration or repair or when otherwise warranted.

CHAPTER 575. ENGINEERING DESIGN STANDARDS FOR PROJECT IMPROVEMENTS

Sections:

575.100 PURPOSE
575.200 GENERALLY
575.300 INTERPRETATION
575.400 FEES
575.500 VARIANCES
575.600 COMPLIANCE REQUIRED
575.700 VIOLATION—PENALTY

575.100 PURPOSE

The purpose of this Chapter is to provide a sound but reasonable basis for design of public improvements, private improvements and private improvements affecting the public in the City, so to provide for the orderly growth and harmonious development of the community, to secure adequate traffic circulation through coordinated street systems with relation to the City arterial and collector

streets, to secure adequate provisions for water supply, drainage and sanitary sewage and other health and safety requirements, and to provide logical procedures for the achievement of these purposes.

575.200 GENERALLY

The *Engineering Design Standards* are the standards and requirements which have been set by resolution of the City Commission for the sound but reasonable basis of design of all development improvements. They are not intended as a substitute for sound engineering judgment.

575.300 INTERPRETATION

The provisions of this Chapter shall be held to be the minimum requirements adopted for the promotion and preservation of public health, safety and general welfare of the City. This Chapter is not intended to repeal, abrogate, annul or in any manner interfere with existing regulations or laws of the state, except that this Chapter shall prevail in cases where this Chapter imposes a greater restriction than is provided by existing statutes, law or regulations.

575.400 FEES

The following fees, as established by resolution of the City Commission, shall be paid by the developer at the time of filing of public improvement plans with the City, or at the time inspection is requested. Such fees shall be in addition to any and all fees required by any statute of the state or any other provision of this Chapter.

Improvement plans (for any type of development)	
Initial review	As established by resolution of the City Commission
Final plan	As established by resolution of the City Commission
Inspections of Improvements	As established by resolution of the City Commission

575.500 Variances.

The City Commission may authorize a variance from these *Engineering Design Standards* when it determines that undue hardship may result from strict compliance. In granting any variance, the City Commission shall prescribe other conditions that it deems necessary or desirable for the public interest. No variance shall be granted unless the City Commission finds:

A. There are special circumstances or conditions affecting the subdivision or project improvement such that a strict application of the provisions of this Chapter would deprive the developer of reasonable use of the property;

B. That the variance is necessary for the preservation and enjoyment of the substantial property right of the developer;

C. That the granting of the variance will not be detrimental to the public welfare or injurious to other property in the area in which said property is situated.

575.600 COMPLIANCE REQUIRED.

The approvals required under the provisions of this Chapter shall be obtained prior to the installation of any subdivision or project improvements within the City, in public streets, public alleys, public rights-of-way and public easements, and/or under the ultimate jurisdiction of the City. All subdivision or project improvements within the City installed in public streets, public alleys, public rights-of-way or public easements, and/or under the ultimate jurisdiction of the City, shall comply with all of the provisions and requirements of this Chapter.

575.600 VIOLATION—PENALTY.

A. Any person found to be violating any provision of this Chapter shall be served by the City with written notice stating the nature of the violation and providing a reasonable time limit for the satisfactory correction thereof. The offender shall, within the period of time stated in such notice, permanently cease all violations. If the violation is considered by a city official to pose a health hazard, correction action may be taken immediately by the city and the cost of correction will be charged to the developer, landowner or person(s) deemed responsible for the violation.

B. Any person who shall continue any violation beyond the time provided for in Subsection (A), is guilty of a misdemeanor and upon conviction thereof shall be punished as provided by Section 200.010 of Article V, Chapter 100, Title I of this Code.

CHAPTER 595. MISCELLANEOUS PROVISIONS

ARTICLE II. STREETS AND SIDEWALKS, REGULATIONS

SECTION 595.110 BUILDING MATERIAL IN STREET

Every person desiring to use the sidewalk or any part of the street for the temporary deposit of building material, during construction or repair of any building or during the temporary use of any sidewalk while excavating any cellar, shall apply to the Engineering Department ~~City Manager~~ for permission to use the same and upon such application the City ~~Manager~~ may grant permission to use the same temporarily for the purpose to be named; and no person shall use or temporarily appropriate any sidewalk or street or any material part thereof without the consent of the City. ~~Manager acting for and on behalf of the Governing Body.~~ A right of way permit, per the Right-of-way Management, Article IV, of this Chapter, shall be obtained for all uses under this Section.

~~**SECTION 595.150 CURB AND GUTTER CONFORM**~~

~~When the grade of the sidewalk and of the gutter do not conform with each other, then the curb shall be put in so as to conform with the gutter, but in no case shall the sidewalk be below the top of the curb, nor shall it be more than six (6) inches above the top of the curb, except when otherwise directed by the City Manager with the approval of the Governing Body.~~

SECTION 595.160 SIDEWALK, CURB AND GUTTER, HOW REPAIRED

When any sidewalk, curb or gutter shall, from any cause, become defective or out of repair, the owner of the property fronting thereon shall within five (5) days of notice by the City Clerk, or their representative, repair the defect and if such defect be not repaired within said five (5) day period, then the City shall repair the same, keeping accurate account of the cost thereof and the same may be assessed and collected as a special assessment against the property abutting thereon. Sidewalks and curb & gutter shall be repaired per the City *Engineering Design Standards*, as adopted by resolution of the City Commission.

~~**SECTION 595.220 SIDEWALKS, LOCATION OF**~~

~~Hereafter all sidewalks shall be constructed on a grade established by ordinance and the line of such sidewalks nearest the lot line shall be one (1) foot from the lot line; provided however, that where local conditions existing at the time any such sidewalk is constructed are such as to render it inexpedient to construct the same on said grade or in said relation to the lot line, such sidewalk may be constructed on such variation from said grade or said distance from the lot line as the Governing Body shall direct.~~

~~**SECTION 595.230 SIDEWALKS, CONSTRUCTION OF**~~

~~Hereafter, all sidewalks shall be constructed of concrete and shall be constructed on a grade established by ordinance and shall be of four (4) classes, viz. "first class", "second class", "third class" and "fourth class". "First class" sidewalks shall be of a width of twelve (12) feet. "Second class" sidewalks shall be of a width of six (6) feet. "Third class" sidewalks shall be of a width of five (5) feet. "Fourth class" sidewalks shall be of a width of four (4) feet. The location of a particular class of sidewalk in a specified location shall be subject to the approval of the Governing Body after receipt of a recommendation from the City Planning Commission of the City of Junction City, Kansas. The construction and specific location of all sidewalks shall be under the direction and supervision of the City Engineer and shall conform to not less than the City's minimum specifications as are on file in the office of the City Clerk and City Engineer.~~

SECTION 595.260 WIDTH OF STREETS, ALLEYS AND UTILITY EASEMENTS

All street, alleys, utility easements and rights-of-way widths within the City ~~of Junction City, Kansas~~, shall ~~be of a minimum width of sixty (60) feet or greater as directed by the Governing Body; all alleys shall have a minimum right-of way width of twenty (20) feet; and all utility easements shall be of the minimum width~~

~~of twenty (20) feet~~ per the City *Engineering Design Standards* as adopted by resolution of the City Commission.

SECTION 595.270 CROSSING OR BREAKING CURBS

It shall be unlawful for any person to drive any vehicle over the curb or sidewalk, except at an established entrance, or to break or remove any such sidewalk or curb without a right-of-way permit therefore; provided, that the City Manager acting for and on the behalf of the City Commission ~~Governing Body~~ may authorize the use of unimproved parking or the improvement of parking for the standing or parking of vehicles when the curb shall be removed and such portion of the street shall be improved for such purposes. All curb and street removal & improvements shall be per the City *Engineering Design Standards* as adopted by resolution of the City Commission.

Section 595.340 VIOLATION PENALTY

~~Any person, firm or corporation violating any of the provisions of this Chapter shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined in a sum not less than ten dollars ($10.00) nor more than one hundred dollars ($100.00) or imprisonment for a period not exceeding thirty (30) days or sentenced to both such fine and imprisonment in the discretion of the Municipal Judge.~~ Failure to comply with the provisions of this Chapter by any person or entity shall be deemed a public offense, punishable by up to $500.00 per violation, per day. Each day a violation of this Chapter occurs shall constitute a separate public offense. Any penalty imposed by this provision shall be in addition to any other remedy at law or equity available to the City arising out of developer's activities in the public right-of- way and public systems.

ARTICLE III. CURB CUTS–PERMITS

SECTION 595.360 APPLICATION FOR PERMIT

Any person desiring to construct a driveway approach or recessed parking area across any curbing, parking sidewalk or sidewalk space shall first make application to the City ~~Engineer~~ for a permit therefore, said application shall be in writing upon a form provided by the City and made available at the Engineering Department ~~office of the City Engineer. Such application shall contain information showing the type and estimated cost of construction, the location and dimensions of the proposed driveway approach or recessed parking area, together with the lot and block number as well as the street and house number, together with a small plot plan showing the proposed location in regard to the area and any other such information as may be required by the City Engineer.~~ The application shall be filed by the property owner or by his/her duly authorized agent, desiring to construct said driveway approach or recessed parking area. ~~by his/her duly authorized agent.~~ All driveway, parking, curb & gutter and street removal &

improvements shall be per the City *Engineering Design Standards* as adopted by resolution of the City Commission.

SECTION 595.370 ISSUANCE OF PERMIT

Such permit shall be issued by the City Engineer or his/her duly authorized representative, if it is determined that the application has complied with the terms of this Chapter. ~~and such reasonable rules, regulations and specifications of the City Engineer. Such rules, regulations and specifications shall have been submitted to the Governing Body of the City of Junction City for their approval, the original of which shall be signed by the Mayor and filed in the office of the City Clerk and a copy of which shall be on file in the office of the City Engineer and shall constitute such rules, regulations and specifications for the conduct of his/her office until such a time as said rules, regulations and specifications shall have been changed or amended by the Governing Body of said City. The work specified in the application shall be completed within one hundred twenty (120) days after the date of issuance of such permit.~~

SECTION 595.380 SUPERVISION, SPECIFICATIONS

All work done under a permit issued in compliance with this Article shall be done under the direction and supervision of the City Engineer or his/her duly authorized representative and shall have been constructed per the City *Engineering Design Standards* as adopted by resolution of the City Commission. ~~under the approved rules, regulations and specifications as are on file in the office of the City Clerk and the City Engineer.~~ A permit issued under the provisions of this Chapter may be revoked by the City Engineer at any time that he/she is satisfied that the work is not being performed in accordance to the provisions hereof.

TITLE VII. - UTILITIES

CHAPTER 700: - WATER AND WATERWORKS

ARTICLE I. - WATERWORKS REGULATIONS AND GENERAL PROVISIONS

SECTION 700.005 - DEFINITIONS.

The following words, terms and phrases used in this Article shall have the meanings ascribed to them in this Chapter, except where the context clearly indicates a different meaning:

"***BENEFITTED PROPERTIES***" means all properties which will derive benefit from the construction of the improvement.

"***CHARGE***" or "***CHARGES***" means the amount charge at the time and in the amount hereinafter provided to each premises in the water supply system for connecting hereinafter provided, to each premises in the water supply system for connecting directly or indirectly for water use and availability, for debt service and for permits and installation.

"***CITY WATER DISTRIBUTION SYSTEM***" means all mains, connections, pipes, meters, hydrants and appurtenances connected with or served by the City water system, including water supplying wells and well houses.

"***DEPARTMENT***" means the City Department of Municipal Services and/or the City operating agent.

"***DEVELOPER***" means the contract holder or anyone else having a beneficial interest in a benefitted property and construction of the water system improvements.

"***ENGINEERING DESIGN STANDARDS***" means the design standards for public and private improvements for project improvements within the jurisdiction of the City, as adopted by resolution of the City Commission.

"***OFF-SITE WATER MAINS***" means water mains constructed off the premises of the developer to be served, which are necessary to afford service to the premises from transmission water mains not adjacent to the premises.

"***OWNER***" means fee title holder, contract holder or anyone else having a beneficial interest in a benefitted property.

"***PREMISES***" means the lands included within the boundaries of a single description as set forth from time to time on the general tax rolls of the City as a single taxable item in the name of a taxpayer or taxpayers at one address but in the case of platted lots shall be limited to a single platted lot unless an existing building or structure is so located on more than one lot as to make the same a single description for purposes of assessment or conveyance, now or hereafter.

"***SERVICE CONNECTION***" means a connection serving a single water customer consisting of one water connection, one curb stop and one meter.

"***UNIT***" means any premises or portion of premises to which there is available or delivered that quality of water ordinarily used in or needed for the occupancy of a residence building by a single family of ordinary size or which is occupied by such a single family.

"***WATER CONNECTION***" means that part of the City water distribution system connecting the watermain with the premises served.

"***WATERMAIN***" means that part of the City water distribution system located with easement lines or streets designed to supply more than one water connection.

"***WATER METER***" means the meter itself, the remote dial and the wire connecting them where pertinent.

"***WATER SUPPLY SERVICES***" means the transportation, metering, pumping and delivery of the City water to the premises now or hereafter connected directly or indirectly to the water supply system.

SECTION 700.010: - MANAGEMENT

The Municipal Waterworks Plant and Water Distribution System shall be managed and operated in accordance with the administrative rules of the City. The active control and supervision of the Waterworks Plant, ~~Sewage Disposal Plant~~ and Water Distribution Systems shall be fixed by the City Manager, subject to the direction of the City Commission ~~Governing Body~~, which shall make all needful ordinances and approve rules and regulations pertaining to the effective management and operation of the ~~Department~~ Water Supply System.

SECTION 700.025: - CITY TO MAKE CONNECTIONS

A. All water main connections shall be design and constructed per the City *Engineering Design Standards* as adopted by resolution of the City Commission. ~~tapped, street excavations made, corporation stops inserted, pipes installed from main to curb, curb stop installed, meters installed, and connections made only by City employees or a duly designated representative of the City licensed as a plumber in this City.~~

B. *Trenching and Backfilling.* All excavations shall be made per the City *Engineering Design Standards* as adopted by resolution of the City Commission. ~~by a plumber and/or contractor in public grounds shall be kept open for no longer than is absolutely necessary to make the connections required. Further, all excavations shall be protected by suitable barriers and/or guards and lights as provided by the ordinances of this City and meet MUTCD (Manual for Uniform Traffic Control Devices) standards for any signage within city right-of-ways. All backfilling of said excavations shall be thoroughly compacted to meet AWWA Manual M14, current edition, and APWA Uniform Standards and left in a condition satisfactory to the City Engineer or a duly authorized representative. Where such excavation is in an unsatisfactory condition, the Public Works Director shall cause it to be repaired and the cost thereof shall be charged to the plumber, whose license will subsequently be suspended until said sum is paid in full to the City Treasurer.~~

C. *Character of Pipe for Service Connections.* All service pipes installed shall be per the City *Engineering Design Standards* as adopted by resolution of the City Commission. ~~on City side and the property side for the purpose of supplying municipal water shall be made of suitable material approved by the City Engineer or a duly authorized representative prior to being installed. Said pipe shall be laid a minimum of thirty-six (36) inches below the established grade.~~

SECTION 700.030: - CURB STOPS AND WASTE COCKS

~~There shall be a curb stop in every service line attached to the water mains, the same to be placed on the City right-of-way or within one (1) foot of the alley if the main is located in the alley. Curb stop and meter shall be placed in an eighteen (18) inch tile where possible, and in other cases the meter shall have an extension dial and curb stop provided with a Buffalo Pattern service box. There shall be one (1) or more stop and waste cocks attached to every supply pipe, so that the water may be shut off and the residence plumbing entirely drained.~~ Curb stops, waste cocks and services boxes, pits, and vaults shall be installed for every water service and shall be per the City *Engineering Design Standards* as adopted by resolution of the City Commission.

SECTION 700.040: - LOCATION OF WATER SERVICE LINES AND METER INSTALLATIONS

All water service lines supplying water from the City to the property, and all meter and meter installations shall be ~~placed in the City right-of-way outside of the property line, or within one (1) foot of the alley line if the main is located in the alley, unless specifically allowed by the City Engineer to place the meter on private property~~ per the City *Engineering Design Standards* as adopted by resolution of the City Commission.

ARTICLE III. - FIRE HYDRANTS

SECTION 700.300: - INSTALLATION OF FIRE HYDRANTS

It shall be unlawful for any person to install, or cause to be installed, on public or private property, any fire hydrant for use other than that type and style per the City *Engineering Design Standards* as adopted by the City Commission ~~presently approved by the water division~~.

SECTION 700.315: - CHANGING LOCATION

Any change in the location of a fire hydrant must meet the approval of the Ffire Cchief and~~,~~ the City Engineer ~~and the water division~~. The cost of moving a hydrant shall be paid by the party desiring the change.

ARTICLE VII - WATER MAIN CONSTRUCTION AND INSPECTION

SECTION 700.710; - PERMIT - REQUIRED

No water main which shall serve or be designed to serve more than one premises shall be constructed, reconstructed or altered in the City unless a permit for such construction, reconstruction or alteration is first procured from the City.

SECTION 700.720; - PERMIT - APPLICATION

Application for a permit under this Article shall be accompanied by complete plans, specifications and cost estimate which shall be submitted to the Department for review and approval before such permit is issued. Such review will include:

A. Checking water main plans for size of mains and adequacy of valves and fire hydrants;

B. Determining protection of pipe, width of trench and strength of pipe by depth of main and type of soil to be encountered;

C. General review of cost estimate for payment of fees;

D. Review for compliance to the City standards and specifications.

SECTION 700.730; - REVIEW FEE

A review fee as established by resolution of the City Commission of the estimated cost of the project as determined by the owner's engineer shall be paid to the City at the time an application for permit is filed under this Article.

SECTION 700.740; - PERMIT FEE - FINAL FIELD INSPECTION

A. A permit fee in an amount as established by resolution of the City Commission shall be deposited with the City to reimburse the ordinary costs incurred by the City for inspection during water main construction. The amount of all fees shall be adjusted to meet the actual cost of inspection of the project after work is completed at which time an additional inspection fee may be required and become payable to the City or a refund made to the owner.

B. Upon completion of the water system improvements they shall be tested per the latest AWWA test requirements for public water supply systems, including chlorination and pressure test. All costs for testing shall be borne by the owner.

C. Upon completion of the project the Department shall make a final field inspection accompanied by the owner's consulting engineer who shall furnish thereto copies of gate valve and well hydrant, and water main locations and sizes to the Department. The owner's engineer shall then prepare as-built drawings of the project per the City *Engineering Design Standards*, as adopted by resolution of the City Commission.

SECTION 700.750-80; RESERVED

SECTION 700.790; PENALTY

Failure to comply with the provisions of this Article by any person or entity shall be deemed a public offense, punishable by up to $500.00 per violation, per day. Each day a violation of this Article occurs shall constitute a separate public offense. Any penalty imposed by this provision

shall be in addition to any other remedy at law or equity available to the City arising out of applicant's activities with the City's water systems.

TITLE VII. - UTILITIES

CHAPTER 705: - SEWERS

ARTICLE I. - PUBLIC AND PRIVATE SEWERS—GENERAL PROVISIONS

SECTION 705.010: - DEFINITIONS

~~Unless the context specifically indicates otherwise, the meaning of terms used in this Article shall be as follows:~~ The following words, terms and phrases used in this Article shall have the meanings ascribed to them in this Chapter, except where the context clearly indicates a different meaning:

"***BENEFITTED PROPERTIES***" means all properties which will derive benefit from the construction of the improvement.

"***CHARGE***" or "***CHARGES***" means the amount charge at the time and in the amount hereinafter provided to each premises in the sanitary collection system for connecting hereinafter provided, to each premises in the sanitary collection system for connecting directly or indirectly for sanitary sewer use and availability, for debt service and for permits and installation.

"***CITY SANITARY SEWER COLLECTION SYSTEM***" means all pipes, connections, meters, and appurtenances connected with or served by the City sanitary system, including sanitary sewer lift stations.

"***DEPARTMENT***" means the City Department of Municipal Services and/or the City operating agent.

"***DEVELOPER***" means the contract holder or anyone else having a beneficial interest in a benefitted property and construction of the water system improvements.

"***ENGINEERING DESIGN STANDARDS***" means the design standards for public and private improvements for project improvements within the jurisdiction of the City, as adopted by resolution of the City Commission.

"***OFF-SITE SANITARY SEWERS***" means sanitary sewers constructed off the premises of the developer to be served, which are necessary to afford service to the premises from collection sanitary sewers not adjacent to the premises.

"***OWNER***" means fee title holder, contract holder or anyone else having a beneficial interest in a benefitted property.

"***PREMISES***" means the lands included within the boundaries of a single description as set forth from time to time on the general tax rolls of the City as a single taxable item in the name of a taxpayer or taxpayers at one address but in the case of platted lots shall be limited to a single platted lot unless an existing building or structure is so located on more than one lot as to make the same a single description for purposes of assessment or conveyance, now or hereafter.

"***SERVICE CONNECTION***" means a connection serving a single sanitary customer consisting of one sanitary sewer connection.

"***UNIT***" means any premises or portion of premises to which there is available or collection that quality of sewage ordinarily generated from the occupancy of a residence building by a single family of ordinary size or which is occupied by such a single family.

"***SANITARY SEWER CONNECTION***" means that part of the City sanitary sewer system connecting the public sanitary sewer with the premises served.

"***PUBLIC SANITARY SEWER***" means that part of the City sanitary sewer collection system located with easement lines or streets designed to provide collection more than one sanitary sewer connection.

"***SANITARY SEWER COLLECTION* SERVICES**" means the transportation, metering, pumping and collection of wastewater of the City sewage from the premises now or hereafter connected directly or indirectly to the public sanitary sewer collection system.

SECTION 705.070: - PUBLIC SEWERS CONSTRUCTION

A. No unauthorized person shall uncover, make any connections with or opening into, use, alter, or disturb any public sewer or appurtenance thereof without first obtaining a written permit from the Engineering Department ~~Public Works Director or duly appointed representative~~.

B. There shall be two (2) classes of building sewer permits:

1. For residential and commercial service, and

2. For service to establishments producing industrial wastes.

In either case, the developer ~~owner~~ or his/her agent shall make application on a ~~special~~ forms furnished by the City. The permit application shall be supplemented by any plans, specifications, or other information considered pertinent in the judgment of the City. A permit and inspection fee, shall fees shall be as adopted by resolution of the City Commission, ~~of five hundred dollars ($500.00) for a residential building sewer permit, seven hundred fifty dollars ($750.00) for a commercial building sewer permit and one thousand dollars ($1,000.00) for an industrial sewer building permit is charged~~ and shall be paid to the City at the time the application is filed. These fees shall apply to new construction connections only.

C. All costs and expense incident to the installation and connection of the building sewer shall be borne by the developer or his/ her agent ~~owner~~. The developer or his/ her agent ~~owner~~ shall indemnify the City from any loss or damage that may directly or indirectly be occasioned by the installation of the building sewer.

D. A separate and independent building sewer shall be provided for every building.

E. Old building sewers may be used in connection with new buildings only when they are found, on examination and test by the City, to meet all requirements of this Section. All costs for the examination and testing shall be borne by the developer or his/ her agent.

F. The size, slope, alignment, materials of construction of a building sewer, and the methods to be used in excavating, placing of the pipe, jointing, testing and backfilling the trench, shall be designed per the City *Engineering Design Standards* as adopted by resolution of the City Commission. ~~all conform to the requirements of the Building and Plumbing Code, AWPA standards, or other applicable rules and regulations of the City.~~

G. No person shall make connection of roof downspouts, interior and exterior foundation drains, areaway drains, or other sources of surface runoff or groundwater to a building sewer or building drain which in turn is connected directly or indirectly to a public sanitary sewer. Any connection of such drains or downspouts are found, they shall be immediately disconnected from the public sanitary sewer system.

H. The connection of the building sewer into the public sewer shall be designed per the City *Engineering Design Standards* as adopted by resolution of the City Commission. ~~conform to the requirements of the Building and Plumbing Code or other applicable rules and regulations of the City, or the procedures set forth in appropriate specifications of the A.S.T.M. and the W.P.C.F. Manual of Practice No. 9. All such connections shall be made gastight and watertight. Any~~

~~deviation from the prescribed procedures and materials must be approved by the Public Works Director or duly appointed representative before installation.~~

I. The developer ~~applicant~~ for the building sewer permit shall notify the Public Works Director or duly appointed representative when the building sewer is ready for inspection and connection to the public sewer. The connection shall be made under the supervision of the Public Works Director or his/her representative.

J. All excavations for building sewer installation shall be adequately guarded with barricades and lights so as to protect the public from hazard and follow the latest edition of MUTCD (Manual for Uniform Traffic Control Devices) standards for all work within street rights-of-way~~s~~. Streets, sidewalks, parkways, and other public property disturbed in the course of the work shall be restored as outlined in the City *Engineering Design Standards* as adopted by resolution of the City Commission. ~~AWWA Manual M14, current edition, as per latest edition of APWA (American Public Works Association) Uniform Standards~~, and as satisfactory to the City.

SECTION 705.130: - ~~RESERVED~~ CONSTRUCTION INSPECTION

A. Air and infiltration testing.

1. All public sanitary sewers constructed in the City shall be tested for groundwater infiltration. All testing shall be performed or caused to be performed by the parties causing the sewer to be constructed. All tests shall be witnessed by the City. The Engineering Department shall be notified at least forty-eight hours prior to such test.

2. Notwithstanding any other ordinance of the City, infiltration rate shall not exceed two hundred fifty gallons per inch of diameter per mile of pipe per twenty-four hours of an overall project nor shall the infiltration exceed five hundred gallons per inch of diameter per mile of pipe per twenty-four hours for any individual run between manholes. In event of infiltration in excess of these amounts, joints shall be recaulked or remade or, if necessary, pipe shall be relaid. The test shall be repeated until results show that seepage has been reduced below the above maximum.

3. If, in the opinion of the City, groundwater conditions at the time of test would not provide for a conclusive test of the extent of infiltration, then an exfiltration test shall be required. If an exfiltration test is determined to be necessary, the maximum exfiltration rate shall be the same as that permitted from infiltration.

B. Abandonment of existing sewage treatment facilities.

At such time as a premises connects to the system, all existing septic tanks, onsite wastewater treatment systems, cesspool or any similar sewage treatment facility serving the premises shall be abandoned in the following manner:

1. The sludge held in the facility, solid and liquid, shall be pumped out and disposed of in a legal manner.

2. The sludge shall not be disposed of into the sanitary sewer system.

3. The facility shall be filled with sand and its top broken out.

C. Costs borne by owner.

All costs and expense incident to the installation and the connection to a public sewer of the building sewer shall be borne by the developer. The developer shall indemnify the City against any loss or damage that may directly or indirectly result from the installation of the building sewer.

D. Permit required—Inspection and approval fee.

Prior to the start of constructing a building sewer, the developer shall obtain a permit from the City and pay an inspection and approval fee for an amount as set by resolution of the City Commission. The Engineering Department shall be notified at least forty-eight hours prior to start of construction.

SECTION 705.150: - MANHOLE—WHEN REQUIRED

When required by the Public Works Director, or duly appointed representative, the owner of any property services by a building sewer carrying industrial wastes shall install a suitable control manhole together with such necessary meters and other appurtenances in the building sewer to facilitate observation, sampling, and measurement of the wastes. Such manhole, when required, shall be accessible and safely located, and shall be constructed in accordance with the City *Engineering Design Standards* as adopted by resolution of the City Commission. ~~with plans and approved by the Public Works Director or duly appointed representative.~~ A manhole shall be installed by the developer ~~owner~~ at his/her expense, and shall be maintained by him/her so as to be safe and accessible at all times.

ENGINEERING DESIGN STANDARDS

Adopted: _____

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These *Engineering Design Standards* are intended to provide a reasonable basis for design of public and private improvements in the City of Junction City. They are not intended as substitute for sound engineering judgment. The Standards may not apply to all conditions, and alternate solutions shall be permitted as approved by the pertinent City Departments.

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SECTION 1
GENERAL

1.1 GENERAL PROVISIONS

These *Engineering Design Standards* are intended to provide a reasonable basis for design of public and private improvements in the City of Junction City. They are not intended as substitute for sound engineering judgment. The Standards may not apply to all conditions, and alternate solutions shall be permitted as approved by the pertinent City Departments.

1.2 SCOPE

The City Junction City *Engineering Design Standards* is composed of six parts: General Provisions, Streets, Water, Sanitary, Storm, and the Record Drawings.

Where, in any specific case, different sections of the Standards specify different requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable.

The regulations are not intended to interfere with, abrogate, or annul any other ordinance, rule or regulation, statute, or other provision of law. Where any provision of these regulations imposes restriction different from any provision of these regulations or any other ordinance, rule, or regulation or other provision of law, whichever provisions are more restrictive or impose higher standards shall control.

1.3 REFERENCED STANDARDS

Whenever references are made to national or industry standards and specifications, methods of testing, materials codes, practices, and requirements, it shall be understood that the latest revision of said references shall govern unless a specific revision is stated. Whenever a reference, standard, or specification is not explicit or not specifically covered by this manual for any engineering and/or construction application, it shall be understood that generally accepted practices, references, standards, and specifications shall govern and shall be approved by the City Engineer.

1.4 PLAN REQUIREMENTS

This Section governs the preparation of plans for public and private improvements within the City, and those under the jurisdiction of the City of Junction City.

Alternatives to the *Engineering Design Standards* may be submitted to the City for consideration. They will be reviewed by the City Engineer and recommendation will be made to the City Commission. Such alternatives shall only be acceptable in those instances where the City finds that the proposed

design(s) will provide an acceptable level of serviceability, ease of maintenance and are consistent with sound engineering practices.

1.4.1 General: The plans shall include all information necessary to build and check the design of public and private improvements (water, sanitary, storm, streets and related appurtenances. The plans shall be arranged as required by the City Engineer. Applicable City Standard Detail Sheets shall be included by reference to standard plan number and title. Plans shall be sealed by a Licensed Professional Engineer in the State of Kansas.

The developer shall submit to the City a minimum of four (4) sets of full-size complete construction plans for review. All plan submittals must go directly to the City. Plans cannot be delivered directly to the City's Consultant Engineer. After the plans receive approval, they will be distributed as follows; one (1) set to the City, one (1) set to the developer/owner, one (1) set to the design engineer and two (2) sets to the City Engineer.

1.4.2 Sheet Sizes: Full-sized plan sheets shall be 24 inches by 36 inches, with white prints having black lines. Half-sized plan sheets shall be 11 inches by 17 inches. Plan and profile shall be drawn on combined or separate plan and profile sheets to minimum scales. All plans sheets shall include the developers and design professionals name(s), address, phone number, fax number and email address.

1.4.3 Scales: Plans shall be drawn at the following minimum scales. Larger scales may be needed to clearly present the design. Bar scales shall be shown on each sheet for each scale.

Plan: 1 inch = 20 feet (preferred), 1 inch = 50 feet (minimum)

Profile:
Vertical: 1 inch = 5 feet (preferred), 1 inch = 10 feet (minimum)
Horizontal: Scale Shall Match Plan Scale

Drainage Area Map:
On Site: 1 inch = 200 feet
Off Site: 1 inch = 1,000 feet

Structural Plans: 1 inch = 1 foot

Graphic Drawings: Standard Engineering (Varies)

1.4.4 Types of Sheets in Plans: The plans shall generally consist of (although all might not be required):

1. Title Sheet
2. General Notes and Quantities
3. General Layout Sheets
4. Plan and Profile Sheets
5. Landscaping Plans
6. Drainage Area Map
7. Storm Water Sheets
8. Traffic Signal Plans
9. Lighting Plans
10. Utility Plan and Profile Sheets
11. Erosion Control Plans
12. Pavement Marking Plans
13. Signing Plans
14. Traffic Control Plans
15. Standard and Special Detail Sheets
16. Cross-Section Sheets

Each sheet shall contain a sheet number, including the individual sheet number and the total number of sheets, proper project identification and date. The engineer's seal shall appear on the title sheet.

1.4.5 Minimum Required Information for Title Sheet:

1. Name of project.
2. Project number (where applicable).
3. Index of sheets included in plans.
4. A location map adequately showing project location in relation to major streets with north arrow and scale.
5. Signature block for city approval.
6. The project control bench marks shall be identified as to location and elevation: NGVD datum. A minimum of two (2) bench marks are required for any project (may be shown on an optional Project Control Sheet inserted directly after the Title Sheet).
7. Name, address and telephone number of the consulting engineer and owner/developer as well as signature block for the owner/developer.
8. List containing name and telephone number of each utility company and the State One-Call System.
9. A legend of symbols shall be shown that apply to all sheets (may be shown on an optional General Notes Sheet(s) inserted directly after the Title Sheet).
10. Design speed plus other traffic information as required by the City Engineer.
11. Engineer's seal, signed and dated.

1.4.6 Minimum Required Information for General Layout Sheet(s):

1. General Notes: Minor construction notes shall appear on the proper plan and profile sheet.
2. North arrow and bar scale. Scale of the general layout map shall be one (1) inch equals one hundred (100) feet.
3. Layout shall include name of subdivision, block designation (if any), lot designation or proposed block and lots, all street names, street alignment with back of curb lines, and an accurate tie to at least one quarter section corner and at least one additional physical permanent feature. An un-platted tract shall have an accurate tie to at least two (2) quarter section corners.
4. Boundary line of project area.
5. Schematic layout of existing conditions and proposed improvements shall be shown; including but not limited to: all proposed streets, grading, sidewalks and utility improvements including storm drainage, sanitary sewers, water lines, street lights, traffic signals, etc.
6. Typical street sections.

1.4.7 Minimum Required Information for Plan and Profile Sheets:

1. North arrows and bar scale.
2. Elevation and location of all applicable benchmarks: NGVD datum.
3. Existing and proposed streets with names and pavement widths.
4. Property lines properly identified as to existing or proposed lot, block and subdivision. Survey base line with adequate ties to land lines.
5. All existing and proposed utilities such as power, gas, oil, water, telephone, sewer, storm and other items shall be properly located in conformance with the best information available in the records of the owner of such facilities, or field location, and identified as to size, type, owner, and material. An itemized quantity list will be required for all proposed utility improvements (water main, sanitary sewer, storm sewer and paving).
6. All existing and known proposed improvements within 50 feet each side of right-of-way and 200 feet beyond the project limits shall be shown at the proper locations. This shall include such existing items as paved streets, curb and gutters, driveways, culverts, fire hydrants, utility poles, trees, shrubs, fences, walls, houses, and other such items, and shall be identified as to type, size, material, etc. as may be applicable.
7. All existing and proposed permanent and temporary easements and right-of-way information, including ownership shall be shown on the plans.
8. Locations and widths of existing and data (K value, stopping sight distance, intersection sight distance, length of curve, curve delta, curve tangent length, middle ordinate, PC, PT, PI, PVI, PRC, etc.). proposed sidewalks.
9. Horizontal curve data and vertical curve
10. Center line stations shall be marked at 100-foot intervals and at other pertinent points.

11. Top back of curb elevations shall be shown at maximum increments of 15 feet or quarter points, whichever is less, along the curb returns at street intersections.
12. Plan view of all ADA ramps showing all corner elevations. ADA ramp details shall also show all slopes of the ramp.
13. Profile shall show existing grade as a dashed line, proposed finish grades or established street grades by solid lines.
14. Storm sewer criteria shall be in accordance with the Storm Systems Criteria.
15. All utility trenches under the 45 degree zone of influence line of existing or proposed pavements, sidewalks or drive approaches shall be backfilled with base rock and/ or sand, compacted to at least 95% of maximum unit weight.
16. Utility crossings of paved roadways will be required to be bored. Open cutting of paved roadways will not be permitted.

1.4.8 Minimum Required Information for Cross-Section Sheets:

1. Street cross section at each station showing existing grade by dashed lines and proposed grade by a solid line. Cross sections to show existing grade lines a minimum of ten (10) feet beyond the right-of-way lines or grading limit, whichever is further. The center line and right-of-way limits shall be shown along with the proposed improvements.
2. Center line elevation of top of pavement.
3. Center line cross sections shall be shown at all intersecting streets and driveways.
4. Location of existing and proposed underground utilities. (It shall be the developer's engineer and contractor's responsibility to verify the existence and location of all existing underground utilities.)
5. Finished grade shall be indicated for all structures.
6. Additional cross sections shall be shown as required to clearly describe the extent of grading operations.
7. For residential development, a mass grading plan shall be required in lieu of cross sections.

1.4.9 Minimum Required Information for Standard and Special Detail Sheets: Detail sheets shall be included to show all details of appurtenances, materials, and construction. All engineering construction plans shall contain the latest version of the applicable City of Junction City Standard Detail Sheets. Other details shall conform to the requirements of the City and are to be drawn clearly and neatly with proper identifications, dimensions, materials and other information necessary to insure the desired construction.

1.4.10 Minimum Required Information for Traffic Control Plans:

1. Limits of any road closures, sidewalk closures, or multi-use trail closures shall be shown along with the traffic control devices used to affect the closure. Any closure restrictions, speed limit, length of time, etc. shall be indicated on the plans.

2. Detour plan shall be designed for traffic affected by closures. Detour signing used in the detour route shall be included in the detour plan.
3. Typical lane closure or lane shift plans including taper lengths and spacing of all channelizing devices. Types and spacing of all traffic control signs and markings shall be shown.
4. A traffic control plan shall be prepared for each phase of construction.
5. All traffic control shall be designed using the traffic control devices and application principals contained in the Manual on Uniform Traffic Control Devices (MUTCD). All required street name and traffic control devices shall be installed by the developer. Signs shall meet the requirements of the MUTCD and reflectivity standards of the City.

1.5 DISTRIBUTION OF PLANS

The developer or their engineer shall be responsible for forwarding plans for approval to any private utility company (gas, electric, phone, cable, etc.) and any Federal, State or County agency whose facilities, easements or rights-of-way may be affected by the proposed construction.

1.6 ENGINEER'S OPINION OF CONSTRUCTION COST

An Engineer's Opinion of Construction Cost must be supplied with the Construction Plan submittal. This estimate will be used by the City to establish review and inspection fees for the improvements in accordance with the City Ordinance(s).

1.7 PLAN REVIEW PROCESS

A general overview of the plan review process is described below:

1.7.1 Site Plan Review

The City's staff, departments, and/ or consultants will review the site plan including: water supply, wastewater disposal, storm water management, site grading, pavement improvements and right-of-way improvements.

Review comments will be issued to the developer/ design engineer.

Once the site plan has been accepted by the Metropolitan Planning Commission, the Developer will be required to submit detailed engineering drawings and an itemized cost estimate of the proposed improvements so that an escrow account may be established for plan reviews and construction observation. The amount of the escrow account will be determined by the City.

1.7.2 Construction Plan Review

The City Engineer will review the construction plans for conformance to City *Engineering Design Standards*. The City will strive to complete a typical review in five business days. More complex reviews may take as long as 10 business days or more. Once the plans are in an acceptable form, the plans will be issued as approved construction plans. The Developer will be responsible to apply for all

required County and State permits including: soil erosion, water supply, wastewater disposal, right-of-way, wetlands, etc.

Public water main and sanitary sewer improvements will require the submittal of plans and permit applications to the City for review and approval, prior to them being forwarded to the governing agency by the City Engineer.

1.7.3 Pre-Construction Meeting

Once the approved engineering plans have been issued, a pre-construction meeting with the Developer (or their representative) and their related contractors, is required prior to the start of any site work. This meeting will verify that all relevant permits have been applied for, that the proper insurance/bonds are provided and to schedule construction observation.

1.7.4 Site Construction and Observation

Observation by the City and/or its consultant(s) will be as described below. The City will assign observation responsibilities at the preconstruction meeting.

Roadways (public and private) - Spot observation on the subgrade and aggregate base. Full time observation curb & gutter and pavement placement.

Parking Lots (public and private) - Spot observation on the subgrade, aggregate base, curb& gutter and pavement placement.

Sidewalks - Spot observation.

Storm Sewer - Full time observation on public facilities, spot observation on private facilities.

Detention/Retention Facilities - Spot observation on grading.

Water Main (public and private) - Full time observation on all facilities with spot observation on 2" diameter and smaller service leads and full time observation on service leads larger than 2" diameter.

Sanitary Sewer - Full time observation with spot observation on private facilities.

Retaining Walls - Spot observation on all structures over 30" in height.

Additional construction observations may be required, on a case by case basis, at the discretion of the City.

Note: The developer will be required to provide backfill density testing for all public utility construction and work within the public road right-of-way.

1.7.5 Bond Inspection and Final Inspections

Once the proposed improvements have been completed, the Developer may request that the City perform a site inspection to establish bond amounts to complete the remaining site improvements for final acceptance by the City.

1.7.6 Record Drawing Plan Review

Record drawings, describing the location and elevations of the proposed site improvements are required to be submitted for review and approval. See Section 6 of the City's *Engineering Design Standards* for the requirement of the Record Drawings submittal. The developer will also be required to submit all public utility easements, detention basin maintenance agreement, off-site easements, etc. for review. Once approved, original copies of the applicable documents shall be submitted for recording at the Geary County Register of Deeds.

SECTION 2
WATER SYSTEMS DESIGN CRITERIA

2.1 GENERAL

These criteria shall be adhered to for the design of all water systems within the City.

2.1.1 INTRODUCTION

A. This document sets design standards for water supply system improvements, extensions and relocations within the jurisdiction of the City and within the service area surrounding the City of Junction City. The following requirements are minimum requirements.

B. These criteria cover design factors and provide guidelines for evaluations of plans and specifications by the City. These criteria are not intended to cover extraordinary situations and in such instances, deviations from the criteria must be approved by the City Engineer.

C. The design of water systems shall be sealed by a Professional Engineer Licensed in the State of Kansas. The designer shall submit such additional design information as the City Engineer requires. Design calculations, soil studies, and field survey data are examples of pertinent design information necessary for plan review.

2.1.2 COMPLIANCE

A. The proposed design shall be in accordance with the City Water Master Plan for the indicated area if formulated.

B. Water distribution system design within the jurisdiction of the City shall conform to the current addition of "Policies, General Considerations, and Design Requirements for Public Water Supply Systems in Kansas" as published by the Kansas Department of Health and Environment (KDHE).

C. Applicable ASTM Standards.

D. The proposed design shall be in accordance with latest version of the International Building Code as adopted by the City.

E. All designs shall meet the minimum required by these design standards.

D. The Kansas Department of Health and Environment, Division of Environment – Bureau of Water must review all water system plans after they are reviewed by the City. No construction can take place until KDHE comments are incorporated and a copy of the issued permit is received by the City.

2.1.3 Pipe Size: Minimum pipe size shall generally be eight (8) inches in diameter. Pipe shall be PVC or ductile iron for water mains.

2.1.4 System Sources: Water mains shall generally be designed with a minimum of two feed sources. Dead end mains will only be allowed under the following criteria:

A. Dead end water mains shall not exceed 700 feet in length.

B. All dead end water mains that are to be extended in the future shall be installed to the limits of the platted subdivision such that extensions to the mains to serve adjacent subdivision plats may be connected at the plat boundary and shall be installed with an inline valve and a temporary fire hydrant that is properly restrained. The valve shall be the same size as the main.

C. All dead end water mains that are not to be extended in the future shall be a minimum six (6) inches in diameter between the last two fire hydrants. No service leads from mains which are greater than 12" in dia. and less than 6" in dia. will be permitted

D. All dead end water mains serving a cul-de-sac shall be extended around the cul-de-sac sufficiently far so that no service lines need to be bored more than the width of the normal, non-cul-de-sac street ROW.

2.1.5 Connection to Existing Mains: Connections to existing mains shall be made in such a manner as to provide the least amount of interruption to water service. In the event that closing of valves to make a connection will affect a customer who cannot be without service, provisions shall be made on the plans for a temporary service. Where possible, connections to existing mains shall be made using tapping sleeves and valves.

When connections are made to an existing system under normal conditions, the exposed pipe and fittings shall be disinfected per AWWA C651.

2.1.6 Tracer Wire: All HDPE, PVC, and Plastic water main pipe shall be required to be provided with a minimum 12 gauge copper, colored black or white tracer wire, running the entire length of the pipe with ends accessible for line location purposes.

2.1.6 Customer Service: Water mains shall generally be designed such that not more than twenty five (25) customers will be without service when sections of the water main are isolated for service or emergency repairs.

2.1.7 Easements: Where required, easements shall be provided for the installation and maintenance of the public water main. Permanent easements shall be a minimum of ten (10) feet in width when adjacent to right-of-way or

access easements. Permanent easements shall be a minimum of fifteen (15) feet in width if not adjacent to right-of-way or access easements. Temporary easements shall be of sufficient width to allow the installation of the water main as shown on the plans. Consideration should be given to size of equipment, materials storage, and trench spoils stockpiling when establishing temporary construction easement widths.

2.1.8 Cross Connection: There shall be no physical connection between the public water main and any pipe, pump, hydrant, tank, or non-potable water supply whereby unsafe water or other contaminating material may be discharged or drawn into the system.

2.2 DESIGN CONSIDERATIONS

2.2.1 Pressure:

A. Water distribution systems shall be designed, constructed, and operated to provide an adequate supply of water at a pressure of not less than 40 psi (276 kPa) at ground level at all points in the distribution system under all flow conditions except extraordinary conditions including unusual peak fire flow demand and major distribution system breaks.

B. The normal working pressure in the distribution system should be in the range of 60 to 80 psi (414 kPa to 551 kPa). It is not uncommon for systems to have a normal working pressure in the range of 90 to 110 psi (620 kPa to 760 kPa) (AWWA, 2005b). Pressures in excess of 100 psi (690 kPa) may be necessary because of fire protection requirements, head loss associated with backflow prevention devices, or the need to serve low-lying areas. In the latter case, pressure reducing valves may be used to lower the pressure in these areas so long as their presence and operation do not conflict with fire protection requirements.

C. Variation in pressure at any single point in the distribution system should normally not exceed 20 to 30 psi (140 kPa to 210 kPa) (AWWA, 2005b). Additional guidance regarding distribution system design and working pressures may be found in the AWWA Manual of Water Supply Practices M32 (AWWA, 2005b).

2.2.3 Quantity:

A. Distribution and transmission mains should be sized to carry peak hourly flow plus fire flow.

B. In the absence of meter data, peak hourly flow can be assumed to be equal to twice the maximum daily flow or four times the average daily flow. Methods for estimating peak consumer demand are provided in the AWWA Manual of Water Supply Practices M22 (AWWA, 2003).

C. The minimum fire flow for one-and two-family dwellings having a fire flow calculation area which does not exceed 3,600 square feet shall be 1,000 gallons per minute with a residual pressure of 40 psi. Fire flow and flow duration for dwellings having a fire flow calculation area in excess of 3,600 square feet shall not be less than that specified in Table B105.1 of the most current edition of the International Fire Code.

D. The minimum fire flow for all other developments shall be 2,000 gpm or more with 40 psi residual pressure as determined by the most current edition of the International Fire Code.

2.3 LOCATION

2.3.1 Horizontal:

A. Water mains shall generally be located three (3) feet from the back of curb.

B. Water mains, if located within dedicated easements, shall generally be centered within the easement and maintain a minimum separation of five (5) feet from the centerline of the pipe to the edge of the easement.

C. Water mains shall be located a minimum of fifteen (15) feet from a building structure and 8 feet from all other structures.

D. No parallel utilities may be laid in the same trench as the water main.

E. Water mains shall generally be located to minimize special engineering conditions and to provide adequate separation from other utilities.

F. Allowable joint deflection shall not exceed manufacturers recommended maximums.

2.3.2 Vertical:

A. Water mains shall be installed with a minimum of forty two (42) inches of cover over the top of the pipe. This minimum of cover shall be from the top of the pipe to the finished grade.

B. The maximum cover allowed shall be seven (7) feet except for short lengths to avoid alignment conflicts.

C. Operable appurtenances such as hydrant and line valves shall generally be located at a depth of six (6) feet or less. Depths of cover for operable appurtenances greater than six (6) feet require the approval of the City Engineer.

2.3.3 Separation:

A. Horizontal Separation:

1. A minimum of ten (10) feet horizontal separation, as measured from the outside edge to outside edge, shall be required between a potable water main and a sanitary sewer main or manhole.
2. Under no circumstance shall potable water main and sanitary sewer be placed in the same trench.
3. When water mains and other utilities are laid parallel to each other the separation distance shall be determined based on geotechnical considerations. A minimum of three (3) feet of undisturbed earth separating the trenches shall be required. Under no circumstance shall water mains and other utilities be installed in the same trench.
4. A minimum distance of twenty-five (25) ft. shall be maintained between all water mains and all pollution sources, e.g., septic tanks, etc.
5. Under no circumstances shall a water main be extended through an area that is a real or potential source of contamination to the water supply.
6. Under no conditions shall the encasement of a water main be considered as adequate protection of a water main or a water supply for the purpose of extending the water main through a real or potential source of contamination.

B. Vertical Separation:

1. A minimum of two (2) feet vertical separation, as measured from the outside walls of the pipe, shall be required between a sanitary sewer main and potable water main.
2. In general potable water mains shall be located above sanitary sewer lines and should cross at as close to perpendicularly as possible.
3. Potable water mains shall maintain a minimum of two (2) feet of vertical separation, as measured from the outside walls of the pipe, and shall always cross above any sewer force main.
4. Protective Measures: When potable water mains and gravity sanitary sewers cross with less than two (2) feet of vertical clearance, and in all cases where the potable water main is located below the gravity sanitary sewer, additional measures must be employed to protect the potable water main. Acceptable measures include:
    a) Install a minimum twenty (20) foot length of sanitary sewer pipe on the crossing to maximize the joint spacing to a minimum of ten (10) feet from the crossing. Construction of the sanitary sewer line using one of the following materials:
        1. Ductile iron pipe conforming to ASTM A536 or ANSI/AWWA C151/A21.52 with a minimum thickness class 50, and gasketed, push-on, or mechanical joints in conformance with ANSI/AWWA C110/A21.10 or ANSI/AWWA C111/A21.11.
        2. PVC pipe conforming to ASTM D3034 with minimum wall thickness of SDR26 or ASTM F679 (PS115) with gasketed push-on joints in conformance with ASTM F477 and D3212.

b) Provide concrete encasement of the sanitary sewer line a minimum of six (6) inches in thickness for a minimum distance of ten (10) feet either side of the pipeline crossing.

2.3.4 Watercourse Crossings:

A. Aerial Crossings: The pipe shall be adequately supported, protected from damage and freezing, and be accessible for repair or replacement.

B. Water mains crossing a watercourse shall be designed to cross the watercourse as nearly perpendicular to the flow direction as possible and shall be on a constant grade.

C. Water distribution systems shall be designed to minimize the number of watercourse crossings.

D. Protection of the water main shall be provided at all watercourse crossings as required to prevent erosion.

E. If the depth of cover over the water main is five (5) feet or less, reinforced concrete encasement or steel casing pipe shall be provided extending the full width of the watercourse crossing to a point ten (10) feet beyond the top of bank.

F. Impervious ditch checks shall be provided immediately downstream of the watercourse crossing.

2.4 APPURTENANCES

2.4.1 Fire Hydrants:

A. Fire hydrants should be connected only to water mains adequately sized to carry fire flows, and located to permit flushing of all mains and in compliance with the latest City Fire Code requirements.

B. Fire hydrants shall be Mueller Super Centurion 250 with a five (5) inch Storz Quick connection and two 2-1/2 inch standard hose connections. Nozzle caps shall be the "nut type" having the same dimensions as the operating nut. Such caps shall be securely chained to the base of the hydrant.

C. All fire hydrants shall be the traffic model, break-away type, and comply with the current AWWA C502.

D. Hydrants shall have a minimum design working pressure of 150 psig and test pressure of 300 psig.

A. Direction to open shall be counterclockwise and be marked as such.

F. Hydrants shall be factory painted (baked on enamel). Hydrant assembly shall be red. Hydrant burry barrel shall be black.

G. For public water mains, not more than one fire hydrant shall be located on any 6-inch dead end main. For private fire lines, the size of fire line and number of hydrants shall be designed by a licensed professional e engineer and approved by the City's Fire Department.

H. Fire hydrants shall be placed no less than four (4) nor more than twelve (12) feet from the back of curb. No hydrant shall be placed in the bottom of a ditch.

I. Hydrant spacing shall not exceed six hundred (600) feet. Fire hydrant spacing will be reviewed and approved by City Fire Department on a case by case basis.

J. Fire hydrants shall generally be placed at intersections, end of permanent dead end lines, and intermediate points when block lengths exceed the required spacing. It is preferred to locate mid-block hydrants at property lines.

K. Only dry-barrel hydrants will be approved for installation.

L. Hydrant drains shall not be connected to a sanitary or storm sewer.

2.4.2 Valves:

A. Valves shall be Mueller A2360-20. Direction to open shall be counterclockwise and be marked as such. Valve boxes shall be provided for buried valves.

B. Water main valve spacing shall not exceed five hundred (500) feet in commercial districts, and eight hundred (800) feet in other districts.

C. Valves shall be placed at all tees, crosses, and other pipe intersections such that pipes in the system can be isolated and service interruptions, if required, may be limited to no more than twenty five (25) customers at a time. No more than 4 valves to isolate a break shall be provided.

D. Valves shall generally be placed no more than three (3) feet from the tee, cross or other pipe intersection.

E. Line valves shall generally be located at property lines or placed such that they can be referenced with respect to certain obvious monuments.

F. At high points in the water main where air can accumulate, provision shall be made to remove air by means of hydrants or air relief valves. Automatic air relief valves shall not be used where flooding of the vault may occur.

2.4.3 Thrust Restraint:

A. Thrust restraint shall be provided for all tees, crosses, wyes, bends, plugs, valves, direction changes, and hydrants.

B. Thrust restraint shall be either restraint joint pipe, thrust blocks, or straddle blocks. Thrust restraint shall be installed so that all joints are accessible for repair.

C. The bearing area of concrete reaction blocking shall be as shown on the standard drawings or as determined by the City Engineer.

D. If adequate support against undisturbed ground cannot be obtained, metal harness anchorages consisting of steel rods across the joint and securely anchored to pipe and fitting or other adequate anchorage facilities shall be installed to provide the necessary support.

2.5 FIRE LINES

2.5.1 General:

A. All water lines and hydrants connected to a dedicated fire line shall be considered private.

B. A fire line shall be defined as a fire protection water main which only has connections to hydrants and/or building fire sprinkler systems.

C. No service leads shall be connected to fire lines.

2.5.2 Backflow Prevention:

A. Construction of all private water mains requires the installation of an isolation valve located at the point the fire line becomes privately owned as well as an approved backflow prevention device and shall comply with the City's currently-adopted Plumbing Code, latest edition.

B. If the point of connection of the private line to the water main is fifty (50) feet or less the backflow prevention may be located within the building. If the point of connection of the private line to the water main is greater than fifty (50) feet then the backflow prevention device must be located outside the building within a privately maintained vault.

2.6 SERVICE LINES

2.6.1 General:

A. All water service lines extending from the public water main to the water meter are public. Service lines extending from the water meter to the building are

private. Service lines shall be at least 10 feet from sanitary sewer manholes and at least 5 feet from storm sewer structures.

B. Services shall be connected with corporation stops for 2-inch and smaller service lines and with a cut-in tee and appropriate valving for larger sizes.

C. An irrigation sprinkler system and its required backflow prevention device shall be tied to the service line outside of the meter well on the customer's side of the meter. Alternatively, a sprinkler system and its required backflow prevention device may be tapped to the public water main. However, this requires payment of a separate tap fee and installation of a separate meter.

D. No splices or fittings (e.g., flared copper coupling, pack joint coupling, 3-part union/coupling, etc.) shall be allowed between the water main and the meter.

E. Any splices between the meter and the customer shall comply with the City's currently-adopted Plumbing Code, latest edition.

F. Each individual residential or business unit, except apartments, shall have separate meters and service lines.

G. Service lines shall not be laid parallel to the ROW or run continuously within the ROW.

H. Service lines two (2) inch and smaller shall be soft type "K" copper and shall extend from the main a minimum of two (2) feet beyond the meter well (between the meter and the private customer).

I. Service lines greater than 2 inches in diameter shall be:
   1. Ductile Iron (DI), special thickness Class 50.
   2. Polyvinyl chloride (PVC), for 6- to 12-inch diameter pipe only AWWA C900 and AWWA C909.
   3. Fusible Polyvinyl chloride (PVC), Fusible AWWA C900 and AWWA C905.

J. There shall be a curb stop in every service line attached to the water main. The curb stop shall be placed within R/W or within one (1) foot of the alley if the main is located in the alley.

K. When a service line is to be abandoned the City shall shut off and cap or plug the line at the corporation stop. If the line is to be utilized at a later date the line will be reactivated by the City at the property owner's expense.

2.7 WATER METERS

2.7.1 General:

A. The water meter shall be placed in the City ROW outside of the property line, or within one (1) foot of the alley line if the main is located in the alley, unless specifically allowed by the City Engineer to place the meter on private property.

B. Water meters must be located outside of paved areas, including sidewalks, unless otherwise approved by the City Engineer. In the event that the meter must be installed in a paved area, the Engineer shall submit plans for a traffic-bearing meter well and lid. The Developer shall pay for the additional costs associated with traffic- bearing meter well and lid for any meters placed in paved areas.

C. The top of the meter shall be 18 inches below the water meter lid.

D. Upon installation of the meter, any relocation or adjustment of the meter shall be at the Developer expense.

2.8 INSTALLATION

A. The Contractor/ Developer shall be responsible for all filling, disinfect and pressure testing all water main construction, per the most current AWWA standards, under the supervision of the City Engineer, prior to final acceptance by the City.

SECTION 3
SANITARY SYSTEMS DESIGN CRITERIA

3.1 GENERAL

These criteria shall be adhered to for the design of all sanitary systems within the within the City.

3.1.1 INTRODUCTION

This document sets design standards for sanitary system improvements, extensions and relocations within the jurisdiction of the City and within the service area surrounding the City of Junction City. The following requirements are minimum requirements.

These criteria cover design factors and provide guidelines for evaluations of plans and specifications by the City. These criteria are not intended to cover extraordinary situations and in such instances, exceptions from the criteria must be approved by the City Engineer.

The design of sanitary sewers shall be sealed by a Professional Engineer Licensed in the State of Kansas. The designer shall submit such additional design information as the City Engineer requires: Design calculations, soil studies, and field survey data are examples of pertinent design information necessary for plan review.

3.1.2 COMPLIANCE

A. The proposed design shall be in accordance with the City Sanitary Master Plan for the indicated area if formulated.

B. Other applicable design standards include the most recent published edition of the following:

1. Kansas Department of Health and Environment (KDHE) Minimum Standards of Design for Water Pollution Control Facilities.
2. Applicable ASTM Standards.
3. The proposed design shall be in accordance with latest version of the International Plumbing Code as adopted by the City.
4. All designs shall meet the minimum required by these standards.

C. The KDHE, Division of Environment – Bureau of Water must review all sanitary sewer plans after they are reviewed by the City. No construction can take place until KDHE comments are incorporated and a copy of the issued permit is received by the City.

3.2 DESIGN FLOWS

3.2.1 General: Sanitary sewers shall be designed to provide capacity for the anticipated maximum hourly quantity of sewage and industrial wastes, with approved allowance for infiltration and other extraneous flows. It should be noted that the infiltration and extraneous flow allowances vary widely within any given area depending on a number of conditions. The values presented in this section are minimum general unit design flows. The design engineer should be cautious in the use of these values as a set rule since local conditions may cause variance from any value noted herein.

3.2.2 Design Period:

A. Collectors Sewers: Sewers of the size up to and including a nominal diameter of eighteen (18) inches shall be designed for ultimate development using existing and/or projected land use for the estimated ultimate population of the area served.

B. Larger Sewers: Sewers with a nominal diameter of larger than eighteen (18) inches shall be designed for a minimum design period of not less than twenty five (25) years using existing and/or projected land use. A longer design period shall be justified by a cost-effectiveness calculation using the "present worth" method. As approved by the City Engineer, staged development may be accepted for major lines with smaller initial sewers and later parallel construction.

3.2.3 Design Flow Factors:

A. Sewerage systems shall be sized to provide for the entire watershed in the City's currently adopted Comprehensive Plan.

B. Sanitary sewers shall be designed to provide capacity for the anticipated maximum hourly quantity of wastewater (hourly peak flow), including appropriate allowance for infiltration and inflow. Actual measured flows shall be used whenever reliable wet and dry weather flow measurements are available.

C. Capacity: In the absence of actual measured flows, the following minimum hourly peak design flows, by land use, shall be used (an infiltration/inflow allowance is included):

Land Use	Minimum Hourly Peak Design Flow Rate (Cubic Feet per second per Acre)
Residential Housing:	
One-and two-family dwellings	0.005
Apartments: (Actual density to be considered)	
a. One through three stories	0.020
b. Four-story and above	0.022
Commercial: (Actual density and tenant types to be considered)	
a. Small stores, offices and miscellaneous businesses	0.010
b. Strip Shopping centers	0.015
c. Regional Shopping Centers	0.015
d. High rise	0.017
Industrial: (Actual density to be considered)	
a. Light	0.016
b. Heavy	As directed by the City Engineer

D. Limitations: These design factors shall apply to watersheds of 300 acres or less. Design factors for watersheds larger than 300 acres shall be as follows unless otherwise directed by the City Engineer:

Area in Acres	Minimum Hourly Peak Design Flow Rate (Cubic Feet per Second per Acre)
301-500	0.017
501-1,000	0.015
1,100-3,000	0.015-0.010 with linear decrease based on watershed

3.3 SEWER LINE SIZING

3.3.1 Gravity Lines: All public sewer lines shall be at least 8 inches in diameter. The downstream sewer pipe shall have the same or larger nominal diameter as the upstream pipe unless otherwise approved by the City Engineer. All public sewers shall be designed to have velocity of not less than 2.0 feet per second when flowing full and half full. The maximum velocity, when flowing full should be

less than l0 feet per second. For maximum velocities, greater than 10 feet per second special consideration shall be given to protect against erosion. All public sewers up to, and including, 18 inches in diameter shall be designed to carry the design flow at two-thirds full, and sewers larger than 18 inches shall be designed to carry the design flow at three-fourths full.

All velocity and flow calculations shall be by *Manning's Formula* using the following equation:

$$Q = \frac{1.486 * (A) * (R2/3) * (S1/2)}{n}$$

Q = Discharge in cubic feet per second
A = Cross sectional area of flow in square feet
n = Roughness coefficient of 0.013 (use regardless of pipe material type)
R = Hydraulic radius (R = A/P) in feet
S = Slope in feet per foot
P = Wetted perimeter in feet

For straight sewer alignment between structures, the following minimum slopes shall be used:

Sewer Diameter (inches)	**Slope in %* n=0.013**
8 inch	0.400
10 inch	0.248
12 inch	0.194
15 inch	0.145
18 inch	0.114
21 inch	0.092
24 inch	0.077
27 inch	0.065
30 inch	0.057
33 inch	0.051
36 inch or greater	0.045

*Exceptions to the minimum slope 8 inch diameter sewer may be approved where a lift station can be eliminated. In these instances a slope of 0.30% may be allowed with prior KDHE approval on a case by case basis with adequate documentation.

All building sewer lines are governed by the City's current adopted Plumbing Code.

3.3.2 Inverted Siphon:

A. Inverted Siphons should have no less than two barrels with a minimum pipe size of 6 inches and shall be provided with necessary appurtenances for convenient flushing and maintenance. For easy hydraulic removal of solids, the following maximum grades are recommended on the rising leg: 6-inch pipe – 11 ½ degrees, 8 to 12-inch pipe – 22 ½ degrees, greater than 12-inch pipe – 45 degrees. The manholes shall have adequate clearance for rodding and in general sufficient head shall be provided and pipe sizes selected to maintain velocities of at least 3.0 feet per second for average flows. The inlet and outlet head losses should be addressed. The details shall be arranged so that the average flow is diverted to 1 barrel and so that either barrel may be taken out of service for cleaning.

B. The manholes located at the beginning and the end of the inverted siphon (upstream and downstream manholes) shall have a minimum internal diameter of 5 feet. This can be accomplished by providing a large hinged access door on the manholes and also provide an access road to one of the end manholes (preferably the upstream to permit convenient flushing). The inlet and outlet elevations shall be established based on hydraulic design to avoid surcharging the upstream line during design peak flow. The upstream manhole structure shall be designed so that the average daily flow is normally diverted to the flow barrel and so that either barrel may be taken out of service for cleaning.

C. The upstream manhole shall have either a vent for discharge of air or an air jumper pipe shall be connected between the upstream and downstream manholes. When air jumper pipes are utilized with an alignment that does not permit self-draining, some provision for automatic dewatering shall be included.

D. The final decision to permit the installation of an inverted siphon lies with the KDHE.

3.3.3 Force Mains:

A. All force mains for public sewers shall have at least a 4-inch nominal diameter except force mains with grinder pump installations may have a smaller size diameter when necessary to insure an adequate flushing velocity. Force mains shall have a velocity in excess of 2 feet per second at design average flow. Force mains should have normal operating velocity in suction lines between 2 feet per second and 8 feet per second and in discharge lines between 3 feet per second and 8 feet per second. Tracer Wire shall be required for all HDPE, PVC, Plastic force mains pipe with a minimum 12 gauge copper, colored black or white tracer wire, running the entire length of the pipe with ends accessible for line location purposes.

B. Construction and pumping costs are factors that should be considered before selecting the size of the force main. Flat sections of force mains 100 feet or longer in length should not be installed on a zero slope.

3.3.4 Air and Vacuum Relief Valves: Air relief and vacuum relief valves shall be provided in the lift station discharge piping and force main to adequately vent air and gas and to allow entrance of air as required. Air relief valves shall be sized to prevent line entrapped gas blockage. Vacuum relief valves shall be sized to protect the discharge pipe from collapsing.

3.4 SEWER ALIGNMENT AND LOCATION

3.4.1 Gravity Lines:

A. Straight Alignment: All sewers shall be designed on straight alignment between manholes unless otherwise directed or approved by the City Engineer

B. Location:

1. General: Sanitary sewers should be located within streets or alleys or, if necessary, in a permanent easement on private property. Imposed loading shall be considered in all locations. Manholes should be located outside of paved areas and not within water courses.
2. Water main and sanitary sewers shall be placed on opposite sides of the street.
3. Sanitary sewers shall not be placed in rear yards.
4. Not less than three (3) feet of cover shall be provided over the top of the pipe in street and alley right of-way. In all other areas, not less than thirty (30) inches of cover shall be provided over the top of the pipe. Sanitary sewers shall be located deep enough to serve existing basements proposed basements or the first floor of buildings with no basements.
5. Easements: Where public sanitary sewers are located outside of existing rights-of-way a minimum permanent sanitary sewer easement shall be provided.
    a. Easements shall be a minimum of ten (10) feet wide when adjacent to existing rights-of-way
    b. Easements shall be a minimum of twenty feet (20) feet wide when detached from the rights-of-way (i.e. between buildings or across undeveloped areas).
    c. For installations greater than ten (10) feet deep, easements shall be a minimum of 2 feet wide for every foot of trench depth. For sewer mains not centered within the easement, the distance from the centerline of the pipe to the edge of the easement shall be at least equal to the depth of the pipe.
    d. Temporary construction easements shall be acquired as necessary to complete the installation of the project.
    e. Legal Descriptions: Legal descriptions shall include drawings indicating the point of commencement, the point of beginning, line bearings, line distances, the ending point, and the area described. The drawings shall be on letter size paper. Legal descriptions and drawings shall be sealed by a

Land Surveyor registered in the State of Kansas and meet the filing requirements of Geary County. All documentation shall be formatted to meet the requirements of the County Recorder. Aerial photographs shall not be used in the background of the drawing.

f. Sewer Mains Extending beyond Platted Areas: In the event that a sewer main needs to extend beyond the platted area of a development, proposed easements shall be provided for the main(s) prior to receiving approval of the Engineering Plans. From the centerline in each direction and the necessary temporary construction easement shall be provided.

g. In addition, provisions shall be made for access to maintain the entire sanitary sewer system. The types and sizes of equipment used for sewer maintenance shall be considered for both manhole location and access easements.

C. Streams:

1. Alignment: Sewers crossing streams should be designed to cross the stream as nearly perpendicular to the stream flow as possible and shall be on a constant grade. Sewer systems shall be designed to minimize the number of stream crossings. Sewers adjacent to streams shall be located outside of the stream bed and sufficiently removed to provide for future possible stream widening and to prevent siltation during construction.

2. Cover Depth: The top of all sewers crossing streams shall be at a sufficient depth below the natural bottom of the stream bed to protect the sewer line. All sewers crossing drainage ways with less than 3 feet of cover depth shall be encased in concrete. In no case shall the top of the encasement be above the stream bed.

3. Structures: Manholes or other structures shall be located as they do not to interfere with the free discharge of flood flows of the stream as required by the agency governing the stream.

4. Materials: Sewers crossing streams shall be concrete encased unless designed using restrained joint ductile iron pipe.

5. Stream Crossing Restoration: Stream crossing restoration information shall be submitted and approved by KDHE as a part of the permit approval process. The submitted information shall insure that the stream channel and banks have been restored to better than pre-existing conditions and measures have been addressed to minimize scour and erosion possibilities.

D. Aerial Crossings: This type of installations should be avoided except when no feasible alternative is possible because of terrain or infrastructure constraints.

1. All aerial sewer crossings must be prior approved by the City Engineer.

2. When joints are allowed by the City Engineer support shall be provided. The support shall be designed to prevent frost heave, overturning, and settlement.

3. Aerial crossings shall be designed using CL 52 Cement Lined DIP insulated with a Polyurethane Foam and wrapped in 20 Gauge Galvanized Spiral Lock pressure pipe.

4. The aerial crossing shall be located so as not to interfere with the flow of the stream as required by the agency governing the stream.
5. Precautions against freezing such as insulation and increased slope shall be provided.
6. Expansion jointing shall be provided between above-ground and below ground sewers.

E. Utility Protection:
1. Water Line: Sanitary Sewers are to be designed to pass a minimum of 2 feet vertical below water lines measures from outside diameter of pipe to outside diameter of pipe. In instances where the sewers do not pass 2 vertical feet below a water line, either a minimum of 6" of concrete encasement of the sanitary sewer must be installed to a distance of 10 feet in each direct from the outside edge of the water line pipe, or DIP pipe shall be used for the location meeting the same distances as encasement. This protective measure applies to all crossings where the sanitary sewers pass above water lines, and to public lines and service connection lines located in easements and rights-of-ways. The crossing shall be arranged so that the sewer joints will be equal distance and as far as possible from water main joints.
2. Water and sanitary sewer lines shall not be placed in the same trench or excavation.
3. Water Works Structures: Sewer line, (i.e., house connections, laterals, trunk lines, interceptors, force mains, etc.), shall not be constructed within a 100 foot radius of a public water supply well. Greater separation may be required where soil and drainage conditions indicate the need for greater protection.
4. Sewer lines constructed of cast iron or solvent welded plastic pipe materials may be constructed within 10 feet of a private water supply well. Sewer lines constructed of non-watertight materials must be at least 50 feet from a private water supply well.
5. Gas, Electric, Telephone, Storm Sewers and Other Utility Lines: A minimum horizontal distance of five (5) feet should be maintained between parallel sanitary sewer lines, storm sewers and utility lines other than water lines.
6. The vertical separation between storm sewers and sanitary sewers should be two (2) feet minimum. If tees and wyes are installed, they should be routed from under gas, electric, telephone, storm sewer and other utility lines.

F. Steep Grades: Sewers on 15 percent slope or greater shall be anchored securely with concrete anchors or approved equal, and spaced as follows: Not over 100 feet for grades 15-20 percent; not over 36 feet center to center for grades 20 percent to 35 percent; not over 24 feet center to center for grades 35 percent to 50 percent: and not over 16 feet center to center for grades 50 percent or greater.

3.4.2 Force Mains: Force mains should be placed in the street or alley right-of-way or if necessary in a permanent easement on private property. Force mains shall be placed at least forty-two (42) inches below the finished grade and generally may follow the topography of the terrain. The location of force mains with respect to water mains and other Utilities, aerial crossings, stream crossings and steep grades shall be the same as for gravity sewers.

3.4.3 New Development Building Services: Where sewers are located in the street or alley right-of-way a connection (wye, tee, saddle or stub) shall be provided for each building site in new development. The connection shall be extended with a service line to the property line of the building site. The connection shall be designed to provide a vertical angle of not less than thirty (30) and no more than forty-five (45) degrees to the horizontal centerline plane of the sanitary sewer. In conformance with the applicable plumbing code, a minimum drop shall be provided of not less than 3.0 feet between the basement floor elevation and sanitary sewer flow line elevation at the point of service line connection. The minimum basement floor elevation which sanitary sewer service can be provided shall be indicated. Consideration shall be given in providing sufficient depth where extra long connections, deep building service connections, or other atypical conditions may exist. Service line stub-outs shall be referenced to the downstream manhole and the centerline of the sewer. Stub-outs at angles other than 90 degrees off of the sanitary sewer shall be referenced by providing the angle between the sewer line and the service line and distance along the service line stub-out.

3.5 SEWER APPURTENANCES

3.5.1 Manholes:

A. General: Manholes shall conform to the standards of the City.
   1. Supplied manholes shall conform to ASTM C478.

B. Manhole Casting:
   1. Flooding: When located in areas subject to inundation by flooding or sheet flow, un-vented and bolted covers shall be provided.
   2. Internal Pressure: When designed to function with internal pressure, un-vented, gasketed and bolted covers shall be provided and rings shall be anchored to manhole walls.
   3. Vandalism: When located in areas where theft and vandalism are expected bolted covers may be required.
   4. Larger than 15-inch Diameter Sewers: When the diameter of the manhole's outgoing sewer is at least 15-inches, bolted covers shall be provided.

C. Inverts: The difference in elevation between the invert of any incoming sewer and the invert of the outgoing sewer shall not exceed 24 inches except where

required to match crowns. When a smaller sewer joins a larger one, the invert of the larger sewer should be lowered sufficiently to maintain the same energy gradient. An appropriate method for securing these results is to place the 0.8 depth point of both sewers at the same elevation. A more conservative method is to match the crown of the smaller sewer to the crown of the larger. The minimum drop through manholes shall be as tabulated below:

Pipe Deflection Angle Range (degrees)	**Drop through Manhole (feet)**
0 to less than 10	0.1
10 to less than 45	0.1
45 and greater	0.2

D. Drop Manholes: Drop manholes should be avoided when possible. Free-fall drop manholes shall not be used. Inside drops are discouraged and shall require special approval by the City Engineer. Where inside drops are used, the incoming flow shall be piped to the manhole invert.

An outside or inside drop pipe, when an inside pipe is used, with a fall greater than 2 feet, a minimum 60" diameter structure shall be provided for a sewer entering a manhole at an elevation of 24 inches or more above the manhole invert. The outside drop pipe shall be protected against breaking or settling by the use of concrete encasement. For pipe diameters of 8 inches to 12 inches, the drop pipe shall have the same nominal diameter as that of the incoming sewer. For larger pipe sizes, a minimum 12-inch diameter drop pipe shall be provided.

E. Diameters: The minimum horizontal clear distance within the barrel of manholes shall be 48-inches.

F. Adjustment Rings: The minimum inside diameter of manholes shall be 42 inches. The minimum diameter of entry ways shall be 22 inches.

H. Cleanouts and Lamp holes: The use of cleanouts and lamp holes is prohibited.

G. Manhole Location: Manholes shall be installed at the end of each line, changes in pipes size, grade at intersections and at changes in alignment. The distances between manholes shall not be greater than 400 feet for sewers 18" and smaller and 500 feet for sewers 21" and larger. When a sewer is located in an easement not abutting street or alley right-of-way, access shall be provided to all manholes.

H. A monitoring manhole is required on the sanitary lead for all non-residential connections to the sanitary sewer system. The monitoring manhole can only have one (1) lead running through it. It must be located on a straight run of lead and cannot be a manhole on a public sewer main. Monitoring manholes shall be constructed per the City standard manhole.

3.5.2 Sanitary Sewer Service Laterals:

A. Service laterals shall extend from the sewer main to the ROW line. Each individual resident or business unit shall be responsible for the ownership and maintenance of the building's service lateral.

B. Building service laterals shall not be installed in pipe sizes 18 inches in diameter or larger.

C. Minimum diameter of sewer service laterals within the City's ROW shall be six (6) inches.

D. All building service laterals shall be SDR 26 (minimum) PVC.

E. Connections to existing service laterals at the ROW line shall be completed using an elastomeric PVC coupler with stainless steel band clamps. The coupler shall be sized to match the diameter and material type of both the new and existing service lateral pipes

F. Individual gravity building service laterals shall not connect directly into manholes.

G. Each individually owned residential or business unit, with the exception of apartments or condominium style properties (where the building sewer lateral is in common ground and access is maintained by the property owners' association), shall have a separate building service lateral.

H. Routing of building service laterals shall be as direct as possible to the sewer main.

I. Slope: Building service laterals shall be installed in accordance with the current Plumbing Code adopted by the City. Minimum slope of service laterals within the City's ROW shall be 1%.

J. In Right-of-Way: Building service laterals shall be installed by the Developer. New service laterals under streets shall be installed prior to construction of the street.

3.6 LIFT STATIONS

3.6.1 General:

A. Lift stations are pumping facilities which are used to convey wastewater from a point beyond which gravity flow is not practical.

B. All lift stations shall have at least two pumps with the size and number of pumps such that the rated capacity of the lift station can be met with the largest pump out of service.

C. The time between starts for any given pump shall be a minimum of 10 minutes with maximum number of starts per hour not to exceed that recommended by the pump motor manufacturer.

D. Unless equipment or facilities are provided which will limit the size of solids reaching the pump suction lift station pumps shall be capable of passing 3-inch diameter sphere.

E. Air and Vacuum Relief Valves: Air relief and vacuum relief valves shall be provided in the lift station discharge piping and force main to adequately vent air and gas and to allow entrance of air as required. Air relief valves shall be sized to prevent line entrapped gas blockage. Vacuum relief valves shall be sized to protect the discharge pipe from collapsing.

F. All equipment in the lift station wet well and that equipment or which can be exposed to gases from the wet well shall conform to the current adopted National Electric Code Class I, Group D, Division I, by the City.

G. Sanitary Sewer Lift Station Detail Sheets shall be submitted to KDHE, once approval has been obtained by the City, along with pertinent information concerning float settings and other project specific information, as required by KDHE, as part of the permit approval process.

3.6.2 Types: Acceptable types of lift stations are as follows:

A. Dry well:
   1. Flooded suction
   2. Wet well mounted with vacuum primed
   3. Wet well mounted with self-priming pumps

B. Wet well:
   1. Submersible pump and motor
   2. Wet well centrifugal with motor located above the wet well

3.6.3 Layout and Siting:

A. Lift stations shall be located on public properties or on easements allowing for construction and access for maintenance of lift station structures, piping, valves, electrical service and all other required appurtenances.

B. A detailed general layout detail of the proposed lift station site that includes the routing of commercial power,, orientation or wet well and valve vault, control panel, and site access shall be submitted to KDHE. In addition to the general project layout required for all sanitary sewer projects.

C. All weather vehicular access shall be provided to lift station sites. Adequate vehicular turnaround shall be provided. Lift station structures and equipment shall be suitably protected from vehicular damage.

D. To allow for maintenance, access shall be available to all mechanical equipment. Means of access shall meet all applicable requirements of the latest edition of applicable OSHA regulations. Access doors and hatches to lift station structures and control panels shall be equipped with lockable features.

E. Lift station wet and dry wells shall be vented with vent openings which prevent entrance by birds, small animals and rain. Wet well vents shall be equipped with odor control facilities where required. Wet and dry wells may be ventilated continuously or intermittently. Wet wells shall be ventilated at the rate of at least 12 air changes per hour if vented continuously and at the rate of at least 30 air changes per hour if vented intermittently. Dry wells shall be ventilated at the rate of at least 6 air changes per hour if vented continuously and at the rate of at least 30 air changes per hour if vented intermittently.

F. Allowance shall be made for removal of all equipment and piping through access openings.

G. Adequate space shall be provided around piping and equipment located inside structures such that personnel can perform all tasks as required for maintenance, removal and replacement of equipment.

H. A hoisting system for maintenance of the lift station shall be provided when an alternate means for equipment removal is not available.

I. Lift station structures and equipment shall remain fully operational and accessible during the 25-year flood. Lift station structures and electrical and mechanical equipment shall be protected from damage by the 100 year flood.

J. Lift stations shall be provided with a SCADA system connect per the latest version operated by the City at the time of lift station approval/ construction and final acceptance by the City. All costs related to connection and start of this SCADA shall be by the Developer.

3.6.4 Power Supply:

A. Pumping facilities shall be designed to operate using available utility power. The design of the pumping facilities shall be coordinated with the supplying electric utility and meet their requirements. Transformers may be required to provide proper voltage for the lift station.

B. Auto-transformer starters shall be used when required by the electric utility or by the City.

C. Provisions for continued operation during power outages shall be made and based on protection of property, safety considerations and the most cost effective alternative which affords the protection acceptable to the City. Acceptable options include: overflow retention basins, standby power generating equipment, alternate electric power supply or alternate pump motor.

D. Normal utility power supply shall provide power for pump motor starting as well as lights, ventilation and other auxiliary equipment necessary for safe and proper operation of the lift station. Sequencing controls shall be provided for staging the starting of pump motors unless the power supply is adequate to share all pump motors simultaneously while other electrical equipment is in operation.

E. Transfer from normal power to emergency or alternate power may be accomplished automatically or manually. When manually transferred, adequate storage of wastewater shall be provided to allow time for the transfer to be implemented. Lift stations shall be provided with an emergency quick disconnect per the City standard as part of the lift station construction.

3.6.4 Monitoring and Control:

A. All monitoring and control equipment shall be located outside of the wet well.

B. Alarm systems shall be provided which activate in the event of any of the following:

1. Power or pump failure
2. Use of a standby or lag pump
3. Unauthorized entry
4. High wet well level

C. A telemetry system shall transmit alarm signals to the desired location and/or audiovisual alarms provided locally at the discretion of the City.

3.6.5 Appurtenances:

A. The proper type of isolation valves shall be provided in the suction line of each pump between the wet well and the pump (this shall not apply to submersible or to vacuum primed lift stations) and in the discharge piping of each pump after the check valve. Isolation valves shall not be located in the wet well.

B. Check valves shall be provided in the discharge piping of each pump, located between the pump and the isolation valve and not located in the pump wet well. Check valves shall be the swing or ball check type. Swing type check valves shall be the outside lever type and shall be horizontally mounted. Ball type check valves may be either horizontally or vertically mounted.

C. Surge protection facilities shall be provided as required to protect the force main and lift station from surge conditions.

D. A sump pump or other suitable means shall be provided to remove water or sewage from the dry well as required protecting equipment located in the dry well.

E. Corrosion of underground surfaces shall be minimized through use of passive or active cathodic protection systems use of appropriate coatings or use of other acceptable means.

3.7 INSTALLATION

A. The Contractor/ Developer shall be responsible for all filling and pressure testing all sanitary sewer construction, per the most current KDHE standards, under the supervision of the City Engineer, prior to final acceptance by the City.

SECTION 4
STORM SYSTEMS DESIGN CRITERIA

4.1 GENERAL

These criteria shall be adhered to for the design of all storm systems within the within the City.

4.1.1 INTRODUCTION

This document sets design standards for stormwater system improvements, extensions and relocations within the jurisdictions of the City and within the service area surrounding the City of Junction City. These cover design factors and provide guidelines for evaluations of plans and specifications by the City. These criteria are not intended to cover extraordinary situations and in such instances, exceptions from the criteria must be approved by the City Engineer.

The design of stormwater systems shall be sealed by a professional engineer licensed in the State of Kansas. The designer shall submit such additional design information as the City Engineer requires: Design calculations, soil studies, and field survey data are examples of pertinent design information necessary for plan review

The stormwater design shall be based on land use in the tributary area as zoned, actually developed, or indicated by an adopted future land use plan, whichever basis produces the greatest runoff.

These design criteria shall apply to all developments, including subdivisions, which alter the surface of the land to create additional impervious surfaces, including, but not limited to, pavement, buildings, and structures with the following exceptions:

A. Redevelopment, Expansion, Renovation, Repair and Maintenance Activities Listed Below

1. Additions to, improvements, and repair of existing single-family and single duplex dwellings.
2. Remodeling, repair, replacement, or other improvements to any existing structure or facility and appurtenances that does not cause an increased area of impervious surface on the site.
3. Remodeling, repair, replacement or other improvements to any existing structure or facility and appurtenances on sites smaller than two acres that does not cause an increased area of impervious surface on the site in excess of 10 percent of that previously existing.

4. Remodeling, repair, replacement, or other improvements to any existing structure or facility and appurtenances that does not cause an increased area of impervious surface on the site in excess of 10 percent of that previously existing, provided the total impervious area of the site is less than 5,000 square feet.

B. New Construction Meeting the Following Criteria
   1. Construction of any one new single family or duplex dwelling unit, irrespective of the site area on which the structure may be situated, provided the total impervious area of the site is less than 5,000 square feet.
   2. Construction of any buildings, structures, and/or appurtenant service streets, drives, and walks on a site having previously provided stormwater management, as part of a larger unit of development, or a site previously relieved of stormwater management requirements.

C. Existing Drainage System: Existing drainage system component pipes, structures, and appurtenances within the project limits may be retained as elements of an improved system providing:
   1. They are in sound structural Condition. Their hydraulic capacity, including surcharge, is equal to or greater than the capacity required by these criteria.
   2. Easements exist or are dedicated to allow operation and maintenance.

Discharge from an existing upstream storm drainage system shall be computed assuming its capacity is adequate to meet the performance criteria listed. The computed discharge shall be used to design the new downstream system even if the actual capacity of the existing upstream system is less.

4.2 DESIGN REQUIREMENTS

In no event will the maximum design rate or volume of discharge exceed the maximum capacity of the downstream land, channel, pipe or watercourse to accommodate the flow. It is the Developer's obligation to meet this standard. Should a stormwater system, as-built, fail to comply, it is the Developer's responsibility to redesign, reconstruct, or make modifications at his/her expense to the stormwater management facilities. Such modifications or additional facilities will be subject to the City Engineer's review and approval.

The following agencies have jurisdiction over streams and/or drainage systems and may require further permits. Other regulations, permits and requirements may not be limited to these agencies.

Federal Emergency Management Agency.
U.S. Army Corps of Engineers.
Kansas Department of Agriculture – Division of Water Resources.
Kansas Department of Health and Environment

4.2.1 Drainage System Design: Storm drainage systems shall be designed for a 10-year intensity rainfall. The *Rational Method*

$$(Q=K\cdot C\cdot i\cdot A)$$

for arriving at storm sewer runoff shall be used.

K shall be as follows:

Design Storm	K
10-year or more frequent	1.0
25-year	1.1
50-year	1.2
100-year	1.25

Rainfall intensities *(i)* shall be determined from the Kansas Department of Transportation Geary County, Kansas Rainfall Intensity Table. The Rainfall Intensity Table can be found at the following website:

www.ksdot.org/burDesign/KansasRainfallIntensities.PDF.

T shall be determined by the TR-55 method or as approved by the City Engineer. The minimum T shall be 5 minutes. T is generally between 5 to 15 minutes for new developments.

The design engineer shall use the following minimum values for "C", the runoff coefficient, in the "Rational Formula" of computing storm water flows.

Surface Type	C Factor
Single Family Residential	0.35
Multi Family	0.55
Commercial	0.70
Industrial	0.70
Agricultural	0.20

Other values of the runoff coefficient may be used or required at the discretion of the City Engineer for such areas as parks, open-spaces or unusual sites.

All storm sewer pipes shall be per Materials within this Section. The following list of "n" values shall be used for design.

Description	n
Closed Conduits	
High Density Polyethylene (HDPE)	0.011
Reinforced Concrete Pipe (RCP)	0.013
Corrugated Metal Pipe (CMPs)	0.024
Open Channels (Lined):	
Gabions	0.025
Concrete	0.015
Riprap	0.033
Grass (Sod)	0.030
Open Channels (Unlined) Excavated or Dredged:	
Earth, straight and uniform	0.027
Channels, not maintained, weeds & brush uncut	0.090
Street Curbing	0.014

Sufficient capacity shall be provided in the storm sewer system to take fully developed upstream drainage into the system. When a storm sewer is designed to provide capacity for upstream areas, the hydraulic gradient shall remain in the pipe.

Storm sewer design calculations, including a drainage area map shall be submitted with the construction plans. The storm district map shall show all onsite and off-site drainage districts. The district limits must be over laid on a proposed grading plan for the site.

All public storm sewers must be located in a public right-of-way or an easement. The minimum storm sewer easement shall be 12 feet. The easement size will vary as required for maintenance and access. Any storm sewer that accepts runoff from abutting property or public right-of-way must be placed in a minimum 12 foot wide storm sewer easement.

If a storm sewer is designed to take on-site drainage only, the hydraulic gradient must be no higher than 1 foot below ground. When the hydraulic gradient is above the top of the sewer pipe, the design elevation of the hydraulic gradient shall be indicated on the profile at each manhole.

4.2.2 Manholes: Manholes shall be located as follows:

A. General:
   1. All changes in alignment
   2. Points where the size of the sewer changes
   3. Points where the grade of the sewer changes
   4. The junction of sewer lines
   5. Street intersections or other points where catch basins or inlets are to be connected.

B. Manhole spacing for storm sewers shall be as follows:

Diameter of Sewer (inches)	Maximum Manhole Spacing (feet)
12 - 18	400
21 - 30	450
36 - 42	500
48	550
54 - 60	600
66 & Larger	650

4.2.3 Storm Sewer Pipe: The minimum diameter of a public storm sewer is 12 inches. A 10 inch diameter pipe will be allowed for sewer lines that pick up footing drain or roof conductor drainage. No open covers will be permitted for a 10 inch diameter storm sewer.

A. Connection must be made at manholes, blind taps are not allowed.

B. End sections are required for all storm sewers.

C. The following information shall be indicated on the storm sewer profile:
   1. Length of run between structures
   2. Type, class, size and slope of pipe and service lines
   3. Rim elevations of all structures
   4. Existing & proposed ground elevations above the route of the sewer
   5. A logical numbering system for structures shall be included
   6. Invert elevations of all sewers at structures
   7. Locations and limits of sand backfill (where required)
   8. Locations and elevations of crossing with other utilities

D. The following table of minimum slopes for storm sewers shall be adhered to:

Size (inches)	Minimum Grade (%)
12	0.32
15	0.24
18	0.18
21	0.14
24	0.12
27	0.10
30	0.09
36	0.07
42	0.06
48	0.05

E. The minimum velocity may not be less than 2.5 feet per second in a pipe flowing full. The maximum velocity in storm sewers shall be 15 feet per second. The contents of a larger pipe will never be discharged into a smaller line even though the slope may be steeper for the smaller line. This principle does not apply, however, to a restricted opening or discharge.

F. Where possible provide a minimum of 3 feet of cover from the top of curb (or road centerline) to the top of any storm sewer.

G. For subdivisions, storm sewers shall be located in the public road right-of-way or in easements adjacent to the right-of-way. Storm sewers shall not be located in rear yards except to pick up rear yard drainage, or for sump pump discharge lines.

H. At all pavement curb inlets located at sumps, 40 lineal feet (20 feet in each direction) of 6 inch perforated edge drain with sock shall be constructed at the back of curb line, backfilled with clean stone.

I. The maximize street spread for a street cross section will be either the crown of the road or one lane of traffic. No more than 1.0 acre of area shall be tributary to one standard curb inlet. Curb inlets may be placed side by side in order to provide for additional capacity.

J. Where lateral storm sewers are proposed, all new homes must be constructed with sump pumps, which discharge to an underground pipe connected to an underground public rear yard drain, or an approved alternate storm drain. The sump pump discharge shall be a minimum of 4 inch diameter and shall be constructed to each lot in a new subdivision from the rear yard under drain. The service line shall be constructed at a minimum 1.0% grade.

K. Culvert crossings shall be designed to meet the storm event before road overtopping.

Street Classification	Minimum Design Storm Capacity
Arterial	50-year
Collector	25-year
Residential	10-year
Residential with Open Channel Downstream	25-year

The depth of overtopping shall be limited to a maximum depth of 7 inches over the road centerline or 14 inches at the gutter line. A guard rail shall be provided at a culvert crossing for any 100-year storm event that has greater than 250 cfs overtopping the road.

4.2.4 Storm Swales: The minimum grade for swales shall be 1.00%.

4.2.5 Storm Systems Best Management Practices: The City encourages the use of Best Management Practices (BMPs) in the design of the storm water collection system. These shall include, but are not limited to: rain gardens, bioswales, green roofs, oil/water separators, porous pavements, etc. Design calculation for the BMPs shall be submitted for review with the construction plans. The use of BMPs will be reviewed and approved on a site by site basis by the City's Engineer. A good source for BMP design criteria can be found at the following website:

kcmetro.apwa.net/chapters/kcmetro/specs/BMPManual_Oct2012.pdf.

The City reserves the right to require additional storm water management criteria/ procedures for a site based on its intended usage and impact on storm water runoff.

4.2.6 Storm Sewer Materials: Allowable pipe material for storm sewers shall be:

A. ASTM C76 reinforced concrete pipe conforming to Classes III, IV or V.

B. Perforated high density polyethylene with smooth interior and annular exterior corrugation meeting requirements of ASTM F2306.

C. Bedding and backfill shall be as shown in the City Standard Detail, Storm Sewer Bedding.

D. Joints for storm sewer shall be tongue and groove premium joints with rubber gaskets.

E. All service line material shall be Schedule 40 PVC or SDR 35.

4.2.7 Detention Basin Design Requirements: A storm water detention basin is required for all new developments in the City, unless it is demonstrated that the downstream system has sufficient capacity for the proposed developed for a 10-year event. The City encourages Best Management Practices (BMPs) of detention facilities.

A. Detention basins shall be designed to detain improved storm water over the developed areas on site. The Developer is not required to detain water from off-site areas in the drainage district.

B. The SCS Type II 24-hr rainfall distribution shall be used for all detention basin design calculations.

C. Detention basins shall be designed to store a volume of storm water to meet the release rates as follows:

Storm Event	Release Rate (cfs/acre)
2-year	0.5
10-year	2.0
100-year	3.0

D. All detention basins shall have an emergency spillway with the capacity to convey a 100-year storm event. The emergency spillway shall be constructed in existing embankment.

E. All open detention basins must be fenced if the side slopes exceed 1 vertical to 6 horizontal. This may be waived by the City when the design is an integral part of the landscaping and the location and depth does not present a potential hazard. The maximum earthen side slope shall be 1 vertical to 3 horizontal. All residential subdivisions detention basins shall be unfenced with a 5 foot minimum flat shoulder around the perimeter of the basin.

F. Fences shall be a minimum of 6 feet high vinyl clad chain link with a locking access gate, 8 feet wide. Alternate types of fencing may be permitted, for aesthetic purposes, subject to approval by the City.

G. An agreement for operation and maintenance of all detention systems must be completed by the Developer and submitted to the City prior to final acceptance of the project by the City. Standard agreement forms are available at the City.

H. The entire detention basin must be seeded or sodded, except below the water line for detention basins designed to have a permanent body of water. A native plant buffer of 10 feet or more is encouraged along the embankments. The City will not approve the basin until turf is established.

I. Riprap is required at all pipe entrances and exits to the basin. The minimum width of the riprap shall be twice the outside diameter of the pipe. The riprap shall extend from bottom of basin to the top of the slope.

J. A minimum of 12 inches of freeboard must be maintained in all detention basins.

K. The overland overflow must be designed as to not flood adjacent properties, and the back-water elevation must be no higher than 1 foot below the lowest ground elevation of the developed area.

L. Detention basins that drain into an open drain must have the outlet pipe invert above the normal water level of the drain.

M. Access and Easements

Permanent access and buffers must be provided for maintenance of a detention facility with the following minimum requirements:

1. The water surface of the design storage pool shall be a minimum of 20 feet from property lines and building structures. A greater distance may be necessary when the detention facility might compromise foundations or slope stability is a consideration.

2. A 20 foot wide access strip, with slopes less than 5 horizontal to 1 vertical, shall be provided around the perimeter of the facility, unless it can be demonstrated that all points of the facility can be maintained with less access provided.

3. The detention facility owner shall also maintain a minimum 20 foot wide access route to the detention facility from a street or parking lot with slopes no greater than 5:1 in any direction.

4. Structures, inlet pipes, outlet pipes, spillways, and appurtenances required for the operation of the facility shall also be provided access which is no less than easement widths as set within this Section

5. Easements are required for all detention facilities. At a minimum the dedicated easements shall include: 1) the detention pond per se, which extends to the design storage pool elevation and the toe of the embankment slope; 2) appurtenances; and 3) access strip areas.

N. Maintenance and Continued Performance

Maintenance responsibility for all elements of the detention facility should be designated prior to construction of any detention facility. However, when no designation is made the property owner shall be considered the responsible party. Annual or more frequent inspections shall be made by the responsible party to assure that all inlet and outlet structures are fully functional and the detention basin has full storage capacity.

SECTION 5
STREETS DESIGN CRITERIA

5.1 GENERAL
These criteria shall be adhered to for the design of all streets within the City.

5.1.1 INTRODUCTION
The purpose of these criteria is to provide uniform procedures for designing and checking the design of streets in the City. Specific criteria have been developed and are applicable to the types of conditions ordinarily encountered in local urban areas. Other special situations may be encountered that require added criteria or more complex design than included herein.

5.1.2 Abbreviations:

AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
APWA	American Public Works Association
ASTM	American Society for Testing and Materials
FHWA	U. S. Department of Transportation/Federal Highway Administration
MUTCD	Manual of Uniform Traffic Control Devices
NGVD	National Geodetic Vertical Datum
ITE	Institute of Transportation Engineers
R-O-W	Right-of-way

5.1.3 Governing Criteria: Design shall be in accordance with the latest edition of the following publications and the current interim supplements thereto except as modified herein or modified for the specific project:

A. Policy on Geometric Design of Highways and Streets, AASHTO.

B. Manual on Uniform Traffic Control Devices for Streets and Highways, FHWA.

C. Roadside Design Guide, AASHTO.

D. Design of Pavement Structures, AASHTO.

5.2 FUNCTIONAL CLASSIFICATION OF STREETS:

Streets are divided into seven street functional classifications: Arterial, Collector, Local Commercial, Local Industrial, Local Residential, Frontage Streets, Cul-De-Sacs.

5.3 STREET DESIGN

5.3.1 Street Layout: The arrangement, character, extent, width, grade, and location of all streets shall conform to the City of Junction City Comprehensive Master Plan and shall be considered in their relation to existing and planned streets, topographical, conditions, to public convenience and safety, and their appropriate relation to the proposed uses of the land to be served by such streets.

5.3.2 Design Criteria: This section governs the general design requirements for streets by type. See Table JC-1. All street design is subject to approval by the City.

TABLE JC-1

	Arterial	Collector	Local Commercial	Local Industrial	Local Residential	Frontage Streets	Cul-De-Sacs
R-O-W Width	100 feet (2)	80 feet	80 feet	60 feet	60 feet (4)	40 feet	60 feet radius
Roadway Width (1)	53 feet (3)	41 feet	41 feet	41 feet	31 feet	24 feet	45 feet radius
Stopping Sight Distance	600 feet	400 feet	400 feet	600 feet	200 feet	400 feet	NA
Min. K Value, Sag Vert. Curve	64	64	30	30	30	30	5
Min. K Value, Crest Vert. Curve	44	44	50	50	20	20	3
Min. Radii for Horizontal Curves	500 feet	250 feet	300 feet	500 feet	200 feet	250 feet	
Maximum Grade	6%	8%	6%	6%	10%	8%	6%
Minimum Grade	5%	5%	5%	5%	5%	5%	5% at gutter line
Minimum Curb Return Radius (5)	45 feet	45 feet	45 feet	45 feet	35 feet	35 feet	

(1) Street width is measured back-to-back of curb.
(2) Additional right-of-way width may be required on both sides of any intersection with another arterial or collector street.
(3) Arterial roadway width is variable; listed measurement is the minimum.

(4) May be reduced in a residential planned development district.
(5) Radius measured to the back of curb. Radius should accommodate the design vehicle(s), as determined by the City Engineer.

5.3.3 Alleys: Alleys shall be a minimum width of twenty (20) feet.

5.3.4 Cul-de-sacs: At locations where streets are to be terminated and a vehicular connection between adjacent streets is not required, the termination shall be a cul-de-sac. Cul-de-sacs shall be constructed to the design criteria in Table JC-1.

5.3.5 Street Design Geometrics:

A. Cross Slopes: The finished cross slopes within the limits of the right-of-way shall be between one quarter (1/4) inch vertical to one (1) foot horizontal, minimum, to one-half (1/2) inch vertical to one (1) foot horizontal, maximum, except for sidewalks which must meet the current ADA requirements. Back slopes shall be 3:1 maximum, 4:1 or flatter desired.

B. Tangent Length: Fifty (50) foot tangent lengths shall be required between reverse curves for residential access and residential local streets. The minimum tangent length between reverse curves shall be 100 feet for collector streets and commercial/industrial local streets. Major and minor arterial streets shall comply with current AASHTO guidelines.

C. Off-Center Street Intersections: Street jogs are to be avoided on arterial and collector streets. On local streets with right-of-way of sixty (60) feet or less, centerline offsets of less than one hundred (100) feet shall be avoided.

D Intersection Angle: It is desirable for all intersections to meet at approximately a ninety degrees (90°) angle. Skewed intersections should be avoided and in no case should the angle be more than one hundred degrees (100°) nor less than eighty degrees (80°).

E. Intersecting Minor/Major Arterial Streets: Where any minor or major arterial streets intersect each other, the crowns of both streets shall be uniformly transitioned into a plane at the intersection. Changes from one cross slope to another should be gradual.

F. Curb Radii: When two streets of different classification intersect, the higher classification street shall govern the curb radii dimension listed in Table JC-1. Equivalent three-center compound curves may be used in lieu of a single radius curve if the design vehicle can be accommodated. Curb ends facing the flow of traffic shall have a five-foot taper from full height to matching existing condition.

G. Sight Distance at Intersecting Streets: Sight distance triangles at intersecting side streets shall be in accordance with the current edition of A Policy on Geometric Design of Highways and Streets, AASHTO. Every effort shall be made to select intersection locations so that the maximum sight distance is possible.

H. Considerations for Connection to Existing and Future Streets: Consideration shall be given to the horizontal and vertical alignment of streets where they connect to existing streets or where streets may be extended in the future.

5.3.6 Driveways:

A. All driveway approaches within public R-O-W shall be constructed of concrete.

B. Driveway grades shall conform to the typical section of the street within the R-O-W. Driveways shall attain a minimum elevation of six (6) inches above the gutter elevation within the R-O-W with a maximum grade of 8%. The algebraic difference in grades at the R-O-W on crest drives shall be 8% maximum and on sag drives shall be 12% maximum.

C. Grades of driveway approaches shall also be constructed to accommodate required sidewalks. Cross slopes on driveways in line with sidewalks must meet the current ADA requirements.

5.3.7 Pavement Transitions: Reduction in pavement width in the direction of traffic flow shall be accomplished by a taper. The minimum length for merging taper shall be determined by the formula L=WxSxS/60 where posted speeds are 45 mph or less. The formula L=WxS should be used for roadways having a posted speed limit greater than 45 mph. Under either formula, L=taper length in feet, W=width of the transition, and S=design speed in mph.

5.3.8 Access for the Disabled: Ramps shall be required at all planned sidewalk-curb intersections in accordance with standard practice and current ADA requirements. Non-standard driveways and alleys will also be designed to the current ADA requirements.

5.3.9 Storm Drainage: All storm drainage shall be designed in accordance with Section 4, Storm Systems.

5.3.10 Survey Monument Boxes: Monument boxes shall be installed at all quarter section corners involved in the street construction. The monument boxes shall be set by a Registered Land Surveyor licensed in the State of Kansas.

5.3.11 Obstructions: Rigid structures such as poles, signs and hydrants shall be placed a minimum horizontal distance of 1.5 feet from the back of curb to

edge of obstruction. When required, guardrail and barricades shall be installed in accordance with the latest AASHTO Roadside Design Guide or as required by the City. Vertical clearance of 14.5 feet shall be provided. Along sidewalks, a minimum vertical clearance of seven feet shall be provided.

5.3.12 Other Design Criteria: Design criteria not covered by this document shall be in accordance with the most current edition of A Policy on Geometric Design of Highways and Streets by the American Association of State Highway and Transportation Officials (AASHTO) or other AASHTO design guides.

5.4 PAVEMENT DESIGN STANDARDS

5.4.1 Minimum Pavement Sections: The pavement thicknesses shown in Tables JC-2 and JC-3 are the minimum allowed for all street types. All pavement sections shall be constructed on a stabilized subgrade with a minimum CBR of ten (10). Methods to achieve the required subgrade CBR may include: mechanical compaction and/or soil modification with fly-ash, cement, or lime addition. The use of geo-grid reinforced granular sub-base may also be considered.

For Arterial, Collector, and Industrial streets a pavement design shall be completed by a Licensed Professional Engineer within the State of Kansas, and shall be based upon project specific traffic and geotechnical engineering studies.

TABLE JC-2: MINIMUM BITUMINOUS ASPHALT PAVEMENT SECTION

Street Classification	Pavement Option	Asphalt Surface (in.)	Asphalt Base (in.)	Granular Subbase (in.)	Subgrade Stabilization (in.)
Arterial	A	2	4	12	8
	B	2	7.5	- -	12
Collector	A	2	4	12	8
	B	2	7.5	- -	12
Local Industrial	A	2	4	12	8
	B	2	7.5	- -	12
Local Commercial	A	2	4	12	8
	B	2	5.5	- -	12
Local Residential	A	2	4	11	8
	B	2	5.5	- -	12
Alleys and Private Parking Lots	A	2	2	11	8
	B	2	5.5	- -	12

TABLE JC-3: MINIMUM PORTLAND CEMENT CONCRETE (PCC) PAVMENT SECTIONS			
Street Classification	**PCC Surface (in.)**	**Granular Base (in.)**	**Subgrade Stabilization (in.)**
Arterial	**8**	**6**	**8**
Collector	**8**	**6**	**8**
Local Industrial	**8**	**6**	**8**
Local Commercial	**7**	**6**	**8**
Local Residential	**6**	**6**	**8**
Alleys and private Parking Lots	**6**	**6**	**8**

5.4.2 Pavement Design Criteria:

A. Minimum AASHTO pavement design parameters for arterial and collector streets are as follows:

1. Design Life: 35-years
2. ADT: Based upon traffic study
3. Truck Traffic: Percentage of truck traffic shall be based upon traffic study
4. Subgrade Support: CBR and k values shall be determined by the project specific geotechnical report
5. Stabilized Subgrade: Stabilized subgrade shall not be used as the subgrade soil strength. It shall be treated as "sub-base" layer, and the underlying native soils shall be used for subgrade values
6. Terminal Serviceability (pt): 2.5
7. Reliability: 95% (ZR = -1.645).

B. The pavement design report must show all the actual parameters used for the design, as well as the design method used.

C. Arterial and collector street pavements shall include stabilized subgrade. Subgrade stabilization shall be (a) flyash treated subgrade, (b) lime treated subgrade or (c) geogrid-reinforced aggregate base or City approved alternative.

D. Arterial and Collector Street Widening.

1. Uncurbed or Interim Street Sections – The widened pavement shall use the crushed aggregate option for subgrade stabilization and have a minimum of 10 inches of bituminous asphalt or City approved alternative.
2. Curbed or improved Streets – The widened pavement shall be the same type as the existing pavement.

E. Minimum thicknesses for bituminous asphalt pavement are shown in Table JC-2 and Portland Cement Concrete (PCC) pavement are shown in Table JC-3.

F. Concrete pavement joint details and joint layout patterns, dowelling and tie bar layout shall be per the City Standards.

5.5 SIDEWALK DESIGN STANDARDS

5.5.1 General Sidewalk Design

A. Sidewalks shall be constructed on both sides of the street and located one (1) foot inside of the ROW line.

B. Sidewalk cross slope shall be 2% maximum, sloped toward the street. When the running slope of the sidewalk is greater than 5%, the cross slope shall be reduced to 1% maximum.

C. The standard cross slope between the sidewalk and back of curb is ½" per foot but may be modified with the approval of the City Engineer.

D. Curb-cut ramps shall be provided at all crosswalks and shall be in accordance with the latest revisions of the Americans with Disabilities Act.

E. ADA compliant detectible warning areas shall be placed on all ramps at street crossings and at commercial driveways.

F. Sidewalks shall be constructed of four (4) inch minimum Portland Cement concrete pavement.

G. Sidewalk ramps shall be constructed of six (6) inch minimum Portland Cement concrete pavement.

5.5.2 Sidewalk Widths

A. Sidewalks shall have a minimum width of Five (5) feet.

B. Sidewalks within the Central Business District shall have sidewalks full width from back of curb to building face. Modifications for streetscaping features may be allowed upon approval of the City Engineer.

5.6 INSTALLATION

A. The installation of streets and sidewalks within the City shall be required to be inspected by the City' Engineer at the following stages:

1. After the sub grade has been rough cut to plan elevation
2. After the placement of aggregate base
3. Full-time during the placement of the bituminous asphalt or concrete pavements

B. The developer or his engineer/ contractor shall be responsible to provide an independent testing firm to certify that the sub-base, aggregate base and bituminous asphalt or concrete meets compaction/ density/ design requirements.

SECTION 6
RECORD DRAWINGS CRITERIA

6.1 GENERAL

Two (2) sets of record drawings (a/k/a as-builts) shall be submitted to the City by the design engineers for review. The record drawings shall contain the following information:

A. Plans shall be provided in both mylar and electronic format. The minimum scale shall be one (1) inch equals 50 feet. All as-built plans shall bear the seal of a registered professional engineer or professional surveyor licensed to practice within the State of Kansas.

B. All as-built lengths and elevations must be labeled as "As-Built". Locations shall be shown on the plans with an accuracy of ± one (1) foot.

C. As-Built drawings shall be tied to the Kansas State Plain Coordinate System.

6.2 REQUIREMENTS

The following individual system requirements must also be submitted:

A. Water System

1. Locate gate valves, wells, hydrants and all water system appurtenances from the nearest property corner (using an X-Y coordinate system).
2. Itemized as-built quantities list, which indicates the size, type, brand name and lengths of water main used. Hydrants, gate & blowoff valves and appurtenances must also be listed showing type, brand name, and quantity.

B. Sanitary System

1. Indicate the length of sewer, invert elevation, rim elevation, percentage of grade, manhole location from the nearest property corner (using an X-Y coordinate system), sewer material and joints used.
2. Itemized as-built quantities list, which indicates the size, type, brand name and lengths of pipe used.

C. Storm System

1. Indicate length of sewer, invert elevation, rim elevation, percentage of grade, manhole location from the nearest property corner (using an X-Y coordinate system), sewer material and joints used.
2. As-built storm system plans are required to be accompanied by a letter (8.5" x 11") signed and sealed by the design engineer stating that the detention/ retention basin is properly sized according to the approved construction plans, and that the outlets are properly located and sized.

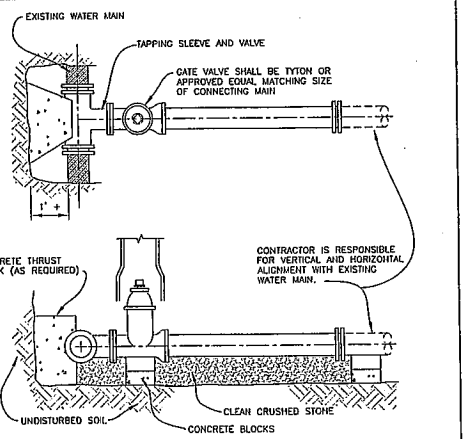
3) Itemized as-built quantities list, which indicates the size, type, brand name and lengths of pipe used.

One (1) CD, of the as-built plans shall be provided to the City, per the City Standards once the as-built plans are in an approval form.

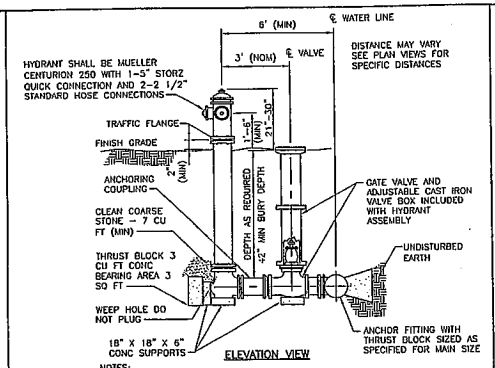
100

WATER MAIN STANDARD – GENERAL NOTES:

1. ALL CONSTRUCTION PROCEDURES AND MATERIALS USED SHALL CONFORM TO THE CITY OF JUNCTION CITY CURRENT STANDARDS AND SPECIFICATIONS.
2. ALL HYDRANTS SHALL BE, MUELLER CENTURION 250 WITH A STORZ CONNECTION AND CHAIN. SELF-DRAINING HYDRANTS SHALL NOT BE USED, ONE TYPE OF HYDRANT SHALL BE USED THROUGHOUT A GIVEN DEVELOPMENT. HYDRANTS SHALL NOT BE MIXED.
3. ALL HYDRANTS SHALL BE PAINTED RED ABOVE GROUND AND BLACK BELOW, WITH A FINISH COAT OF GLAMORTEX 501 ENAMEL, COLOR 314 VERMILLION, OR APPROVED EQUAL.
4. ALL VALVES WITH OPERATING NUTS AT A DISTANCE GREATER THAN 5' BELOW GROUND SURFACE SHALL BE PROVIDED WITH AN EXTENSION STEM. THE LENGTH OF THE STEM SHALL BE SUCH THAT IT WILL BE WITHIN 5' OF THE GROUND SURFACE WHEN AN EXTENSION STEM IS USED. IT SHALL BE PLACED BY AN EXTENSION STEM GUIDE. THE EXTENSION STEM SHALL BE MECHANICALLY ATTACHED TO THE OPERATING NUT. DETAILS OF THE EXTENSION STEM AND METHOD OF INSTALLATION SHALL BE APPROVED BY THE CITY PRIOR TO USE.
5. FOR PIPE DIAMETERS LESS THAN 20" DUCTILE IRON PIPE SHALL BE CLASS 52 DOUBLE CEMENT LINED WITH TWO BRASS WEDGES PER JOINT, MINIMUM DEPTH OF COVER IS 42" BELOW FINISHED GRADE.
6. ALL PRECAST CONCRETE GATEWELL SECTIONS SHALL BE MANUFACTURED TO CONFORM WITH A.S.T.M C478. STANDARD SPECIFICATION FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS, EXCEPT WALL THICKNESS SHALL BE SHOWN ON THESE DETAILS. ALL JOINTS FOR PRECAST CONCRETE GATEWELL SECTIONS SHALL BE "MODIFIED GROOVED TONGUE" WITH GASKET MANUFACTURED TO CONFORM WITH A.S.T.M. C443, STANDARD SPECIFICATIONS FOR JOINT CIRCULAR CONCRETE SEWER AND CULVERT PIPE USING RUBBER GASKETS.
7. THE CONTRACTOR SHALL OBTAIN A WATER MAIN CONSTRUCTION PERMIT AND WATER USE PERMIT PRIOR TO THE START OF CONSTRUCTION FROM THE CITY OF JUNCTION CITY.
8. THE CONTRACTOR SHALL NOTIFY THE CITY OF JUNCTION CITY (785) 238-3103 FOR WATER MAIN, PRESSURE TEST WITNESS, BACTERIOLOGICAL SAMPLING, AND FOR FINAL INSPECTION (MINIMUM 48 HOURS PRIOR NOTICE IS REQUIRED).
9. FOR NON CITY ADMINISTERED PROJECTS ALL WATER SERVICE CONNECTIONS ARE MADE BY THE CITY OF JUNCTION CITY, DEPARTMENT OF PUBLIC WORKS PERSONNEL AFTER WATER MAIN ACCEPTANCE AND APPLICABLE PERMITS ARE OBTAINED.
10. ALL NECESSARY EASEMENTS SHALL BE PROVIDED IN THE NAME OF THE CITY OF JUNCTION CITY FOR WATER INSTALLATION, OPERATION, AND MAINTENANCE OF THE PROVIDED WATER MAINS BEFORE ACCEPTANCE OF THE WATER DISTRIBUTION SYSTEM.
11. THE DESIGN ENGINEER SHALL FURNISH THE CITY OF JUNCTION CITY WITH "AS BUILT" WATER MAIN PLANS PER THE CITY STANDARDS. UPON JOB COMPLETION, PLANS SHALL LOCATE ALL WATER MAINS, HYDRANTS AND GATE VALVES AND WELLS PER CITY OF JUNCTION CITY "AS BUILT" STANDARDS.
12. AS REQUIRED CROSS CONNECTION AND CONTROL DEVICES SHALL BE INSTALLED AS REQUIRED BY THE CITY OF JUNCTION CITY AND IN ACCORDANCE WITH THE STANDARDS OF THE CITY.
13. TAPPING SLEEVES SHALL BE MECHANICAL JOINT.
14. THE CONTRACTOR SHALL NOTIFY THE CITY OF JUNCTION CITY, DEPARTMENTS OF PUBLIC WORKS AND ENGINEERING 48 HOURS PRIOR TO THE START OF THE CONSTRUCTION AND REQUEST INSPECTION.
15. ALL TRENCHES UNDER THE 45 DEGREE LINE OF INFLUENCE OF EXISTING OR PROPOSED PAVEMENTS, SIDEWALKS, & DRIVE APPROACHES SHALL BE BACKED FILLED WITH CLEAN COMPACTED GRANULAR MATERIAL COMPACTED TO 95% OF MAXIMUM UNIT WEIGHT.
16. ALL WATER MAIN JOINTS REQUIRING RESTRAINT SHALL USE MEGA-LUG FITTINGS OR FIELD-LOK GASKETS, FOLLOWING MANUFACTURE GUIDELINES. THE USE FOR CONCRETE THRUST BLOCKS WILL NOT BE ALLOWED.
17. TRACER WIRE IS REQUIRED ON ALL HDPE LEADS (SDR5, AWWA C-901, ASTM D2737). IT SHALL BE A MINIMUM OF 12 GAUGE COPPER, COLORED BLACK OR WHITE, AND RUN THE ENTIRE LENGTH OF THE PIPE WITH THE ENDS ACCESSIBLE FOR LINE LOCATION PURPOSE.



TYPICAL TAPPING SLEEVE CONNECTION
N.T.S.

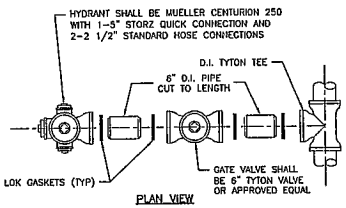


ELEVATION VIEW

NOTES:

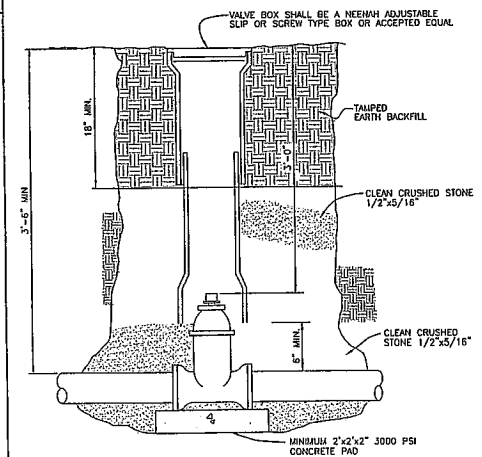
1. RETAINER GLANDS REQUIRED ON ALL FITTINGS. RESTRAINED JOINTS SHALL BE REQUIRED WHERE INDICATED OR DICTATED BY AVAILABLE SPACE OR UNSUITABLE SOIL CONDITIONS.
2. HYDRANT BODY SHALL BE PAINTED RED.

TYPICAL FIRE HYDRANT INSTALLATION
N.T.S.



PLAN VIEW

TYPICAL HYDRANT PIPING LAYOUT
N.T.S.

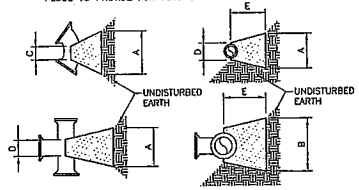


TYPICAL VALVE INSTALLATION
N.T.S.

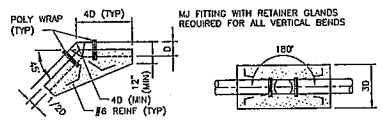
PIPE SIZE	FITTING	DISTANCE IN INCHES A	B	C	D	E
4" AND SMALLER	11.25 & 22.5°	9	9	8	8	6
	45°	18	9	8	8	12
	90°	21	12	8	8	12
	TEE/PLUG	15	12	8	8	12
6"	11.25 & 22.5°	12	12	8	10	12
	45°	27	12	8	10	12
	90°	33	18	8	10	12
	TEE/PLUG	24	18	8	10	12
8"	11.25 & 22.5°	18	15	8	10	12
	45°	33	15	8	10	18
	90°	42	24	8	10	18
	TEE/PLUG	30	24	8	10	18
10" & 12"	11.25 & 22.5°	27	24	12	12	18
	45°	51	24	12	12	24
	90°	63	36	12	12	30
	TEE/PLUG	45	36	12	12	24
14" & 16"	11.25 & 22.5°	33	33	12	16	18
	45°	69	33	12	16	30
	90°	84	48	12	16	36
	TEE/PLUG	60	48	12	16	30

NOTES:

1. THRUST BLOCKS ARE BASED ON A WORKING PRESSURE OF 100 PSI, PLUS 100% SURGE, AND 2000 PSF ALLOWABLE SOIL BEARING PRESSURE.
2. FOR PIPE SIZES NOT SHOWN USE DIMENSIONS FOR NEXT LARGER SIZE.
3. USE 3/8" PLYWOOD SEPARATOR BETWEEN BLOCKS AND PLUGS TO PROVIDE FOR FUTURE REMOVAL.

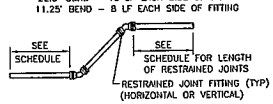


CONCRETE THRUST BLOCK DETAIL
N.T.S.

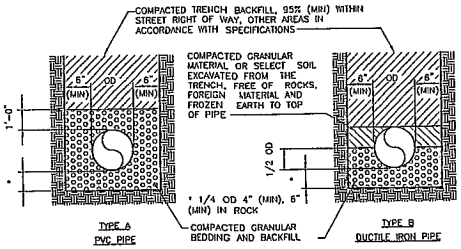


VERTICAL BEND THRUST BLOCK DETAIL
N.T.S.

SCHEDULE
90° BEND – 86 LF EACH SIDE OF FITTING
45° BEND – 36 LF EACH SIDE OF FITTING
22.5° BEND – 18 LF EACH SIDE OF FITTING
11.25° BEND – 8 LF EACH SIDE OF FITTING



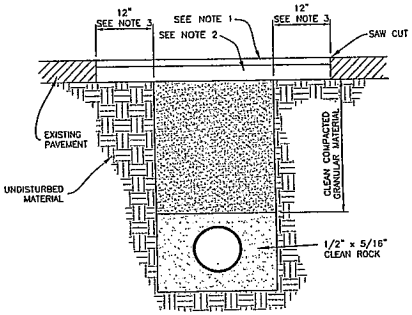
TYPICAL RESTRAINED JOINT PIPE DETAIL/SCHEDULE
N.T.S.



NOTES:

1. UNDERGROUND MARKING TAPE MARKED "CAUTION WATER LINE BURIED BELOW" BY TERRA TAPE OR APPROVED EQUAL. LOCATED 12" BELOW FINISHED GRADE.
2. TRACER WIRE FOR ALL WATER LINE PIPE SHALL BE HIGH MOLECULAR WEIGHT – POLYETHYLENE TRACER WIRE, 1–#12 AWG, BY PAIGE ELECTRIC OR APPROVED EQUAL. SPICING SHALL BE WITH 3M DBY/DBR DIRECT BURY SPLICE KITS. TRACER WIRE LEAD CONNECTIONS TO BE LOCATED IN GATE VALVE BOX AS SHOWN IN TYPICAL GATE VALVE INSTALLATION DETAIL.
3. PIPE SHALL BE INSTALLED WITH A MINIMUM 42" COVER.

PIPE INSTALLATION DETAILS – OUT OF TRAFFIC AREAS
N.T.S.



NOTES:

1. TWO (2) INCH ASPHALTIC CONCRETE SURFACE.
2. EIGHT (8) INCH MINIMUM PORTLAND CEMENT CONCRETE BASE OR SIX (6) INCH MINIMUM ASPHALTIC CONCRETE BASE (FOR LARGE AREA PATCHING ONLY) IF APPROVED BY THE DIRECTOR OF PUBLIC WORKS. FOUR (4) INCH ASPHALTIC CONCRETE BASE WILL BE PERMITTED IN RESIDENTIAL ASPHALT DRIVEWAYS.
3. THE TWELVE (12) INCH OVERCUT WILL NOT BE REQUIRED FOR CUTS NOT EXCEEDING EIGHT (8) INCHES IN WIDTH.

CITY STREET CUT REPLACEMENT
N.T.S.

CITY OF JUNCTION CITY, KANSAS

WATER MAIN INSTALLATION DETAILS

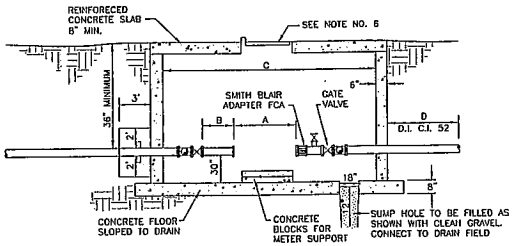
MUNICIPAL SERVICES DIRECTOR
GREGORY S. McCAFFERY, P.E.

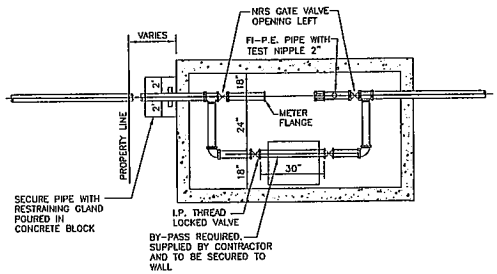
DATE:
10/08/2013

ENGINEERING DEPARTMENT
700 N JEFFERSON
JUNCTION CITY, KS 66441
(785) 238-3103

DESIGN: –
DRAWN: –

SHEET 1 OF 2





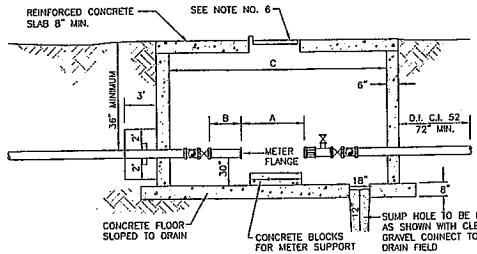
GENERAL RULES:

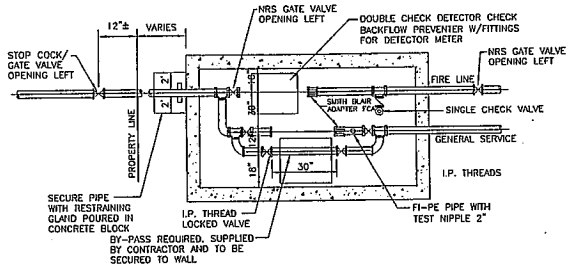
1. METER VAULT WALLS TO BE POURED CONCRETE, CONCRETE BLOCK OR PRECAST CONCRETE.
2. METER VAULT ROOF TO BE REINFORCED CONCRETE.
3. METER VAULT TO BE LOCATED, WHEN POSSIBLE, OUTSIDE TRAFFIC AREA AND WHERE SURFACE WATER WILL NOT DRAIN INTO IT. VAULT MUST BE KEPT FREE OF WATER.
4. DUCTILE IRON CLASS 52 OR C900 THROUGH VAULT.
5. FLANGED VALVES ON EACH SIDE OF METER MUST BE ADEQUATELY SECURED TO WITHSTAND WATER THRUST WITH METER REMOVED.
6. NON-TRAFFIC: BILCO "K-1" SINGLE LEAF ALUMINUM OR APPROVED EQUAL.
   IN TRAFFIC: EJIW 1040 TYPE F OR APPROVED EQUAL APPROVED BY THE CITY ENGINEER.
7. CONCRETE FLOOR REQUIRED. SLOPE TO DRAIN.
8. ALL FITTINGS ARE TO BE FLANGED (TEES, BENDS, ETC.) BEYOND VALVES.

METER SIZE	A	B	C	D	BY-PASS (*)
3"	18-3/4"	24"	140"	48"	1-1/2"
4"	22-1/4"	33"	157"	72"	2"
6"	27-3/4"	41"	191"	72"	3"

(*) IF HIGH CONTINUOUS RATE OF FLOW IS REQUIRED, A LARGER BY-PASS MAY BE PERMITTED, BUT NOT LONGER THAN PRIMARY DOMESTIC SERVICE

METER VAULT FOR 3", 4" AND 6" SERVICE LINES
N.T.S.





GENERAL RULES:

1. METER VAULT WALLS TO BE POURED CONCRETE, CONCRETE BLOCK OR PRECAST CONCRETE.
2. METER VAULT ROOF TO BE REINFORCED CONCRETE WITH OPENING CENTERED OVER GENERAL SERVICE METER ON FIRE LINE DETECTOR CHECK VALVE.
3. METER VAULT TO BE LOCATED, WHEN POSSIBLE, OUTSIDE TRAFFIC AREA AND WHERE SURFACE WATER WILL NOT DRAIN INTO IT. VAULT MUST BE KEPT FREE OF WATER.
4. DUCTILE IRON CLASS 52 OR TYPE "K" COPPER THROUGH VAULT.
5. VALVES ON EACH SIDE OF GENERAL SERVICE METER FOR 1-1/2" OR 2" SERVICE TO HAVE SCREW ENDS, I.P. THREADS; FOR 3" AND ABOVE VALVES MUST HAVE FLANGED ENDS, BE IN ALIGNMENT AND BE ADEQUATELY SECURED TO WITHSTAND WATER THRUST WITH METER REMOVED.
6. NON-TRAFFIC: BILCO "K-1" SINGLE LEAF ALUMINUM OR APPROVED EQUAL.
   IN TRAFFIC: EJIW 1040 TYPE F OR APPROVED EQUAL APPROVED BY THE CITY ENGINEER.
   NON-TRAFFIC METERS ARE PREFERRED.
7. ALL FITTINGS ARE TO BE FLANGED (TEES, BENDS, ETC.) BEYOND VALVES.

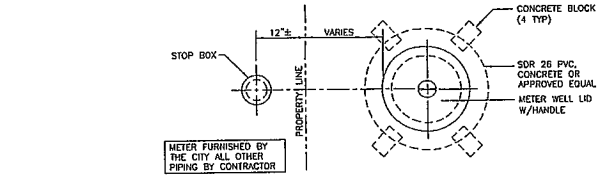
	GENERAL SERVICE				FIRELINE			
	SIZE (***)	BY-PASS SIZE (*)	A	B	10" C	8" C	6" C	4" C
(**)	1-1/2"	NA	13"	12"	140"	130"	130"	130"
(**)	2"	NA	17"	16"	140"	130"	130"	130"
	3"	1-1/2"	18-3/4"	24"	159"	157"	156"	155"
	4"	2"	22-1/4"	32"	174"	172"	171"	170"
	6"	3"	27-3/4"	48"	206"	204"	203"	202"

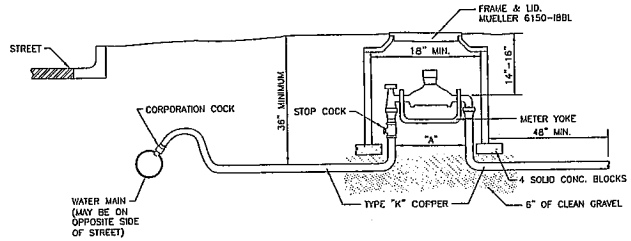
(*) IF HIGH CONTINUOUS RATE OF FLOW IS REQUIRED, A LARGER BY-PASS MAY BE PERMITTED, BUT NOT LONGER THAN PRIMARY DOMESTIC SERVICE

(**) FORD METER SETTER VB66 OR VB77 WITHOUT BY-PASS OR APPROVED EQUAL

(***) FOR 5/8", 3/4" AND 1" METERS USE FORD YOKE #501, 502 OR 503 OR APPROVED EQUAL. NO BY-PASS REQUIRED.

METER VAULT FOR SPLIT SERVICE LINES
N.T.S.





GENERAL RULES:

1. METER PIT TO BE LOCATED OUTSIDE TRAFFIC AREA WHERE SURFACE WATER WILL NOT DRAIN INTO IT.
2. ALL FITTINGS TO BE BRASS OR COPPER.
3. METER WELL TO BE SET ON 6" GRAVEL BEDDING.

METER SIZE	DIMENSION "A"	MUELLER
5/8"	18"	B-2410
3/4"	21"	B-2423
1"	21"	B-2423

METER BOX FOR 3/4", 1", AND 1-1/2" SERVICE LINES
N.T.S.

CITY OF JUNCTION CITY, KANSAS

WATER MAIN INSTALLATION DETAILS

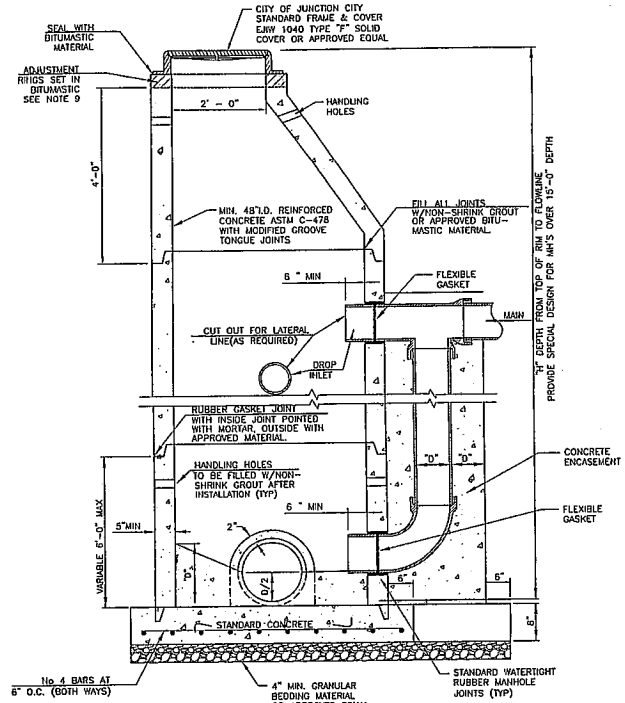
MUNICIPAL SERVICES DIRECTOR
GREGORY S. McCAFFERY, P.E.

DATE: 10/08/2013

ENGINEERING DEPARTMENT
700 N JEFFERSON
JUNCTION CITY, KS 66441
(785) 238-3103

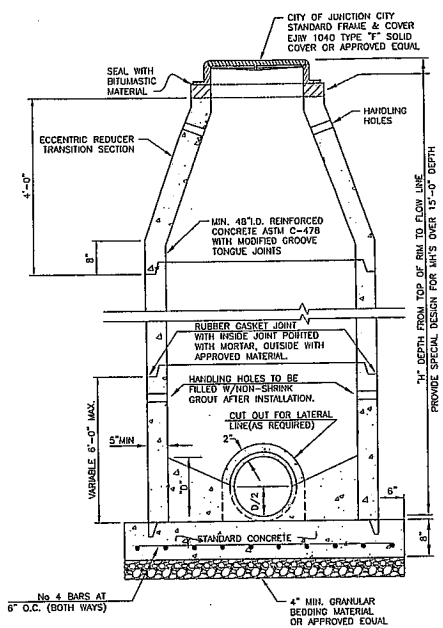
DESIGN: –
DRAWN: –

SHEET 2 OF 2



NOTE:
INTERNAL DROP CONNECTIONS WILL BE CONSIDERED ON A CASE BY CASE BASIS, BY THE CITY ENGINEER.

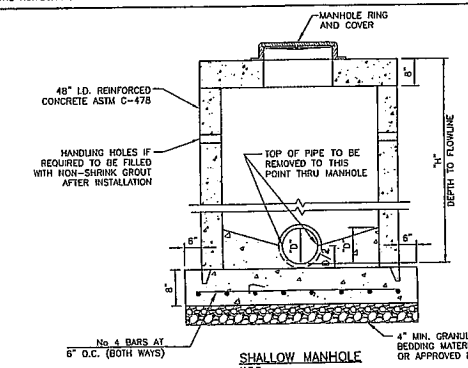
DROP MANHOLE CONNECTION
N.T.S.



SANITARY MANHOLE
N.T.S.

SANITARY GENERAL NOTES:

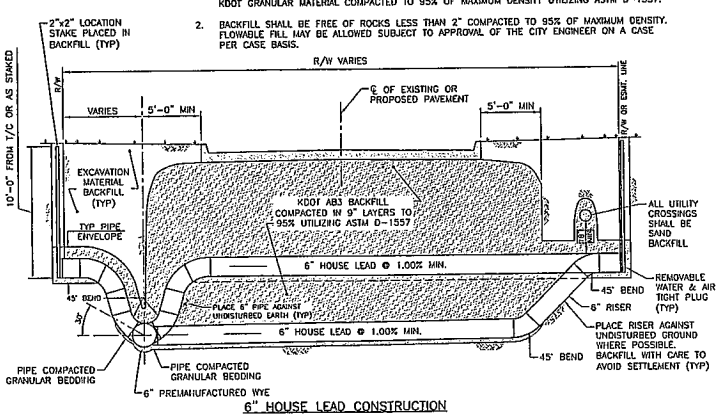
1. ALL MANHOLES ARE TO BE PRECAST CONCRETE AND OF ECCENTRIC CONE TYPE UNLESS PRIOR APPROVAL HAS BEEN GIVEN BY THE CITY ENGINEER.
2. REINFORCEMENT IN ALL SECTIONS SHALL EQUAL OR EXCEED ASTM C-478 SPECIFICATIONS.
3. MANHOLE RING AND COVER SHALL BE NEENAH R-1736, EAST JORDAN 1040, TYPE A OR APPROVED EQUAL.
4. A DROP MANHOLE SHALL BE CONSTRUCTED WHEN THE FLOWLINE OF THE INCOMING LINE IS GREATER THAN 24 INCH ABOVE THE FLOWLINE OF THE MANHOLE INVERT.
5. STEPS SHALL NOT BE INSTALLED IN MANHOLE SECTIONS.
6. MANHOLE SPACING SHALL NOT EXCEED 400 FEET WITHOUT APPROVAL OF CITY ENGINEER.
7. MANHOLES OVER 15'-0" DEPTH SHALL HAVE A 5'-0" MINIMUM DIAMETER.
8. 2" TO 6" CONCRETE GRADE RINGS WITH FINISHED TOP AND BOTTOM SURFACES, GRADE RINGS SHALL BE USED ONLY IN LAWN AREAS WITH RUBBER GASKETS, CONCRETE BRICKS AND MORTAR IN ALL OTHER AREAS. OUTSIDE FINISHED WITH 1/2" PARGING SHALL BE 1:2 CEMENT MORTAR ONE COAT.
9. ALL EXCAVATION SHALL BE UNCLASSIFIED.
10. BEDDING MATERIAL SHALL BE 1/2" TO 3/4" CLEAN CRUSHED ROCK.
11. TRENCH BANKS SHALL BE CUT BACK ON SLOPES IN ACCORDANCE WITH CURRENT OSHA REGULATIONS. SLOPES MUST NOT EXTEND BELOW TOP OF BEDDING.
12. MATERIAL FOR ALL PUBLIC SANITARY SEWER MAINS SHALL BE IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
13. ALL PRIVATE SANITARY SEWER LATERALS SHALL BE 6" PVC, SDR-26.
14. ALL WATER LINES SHALL HORIZONTALLY CLEAR STORM SEWER STRUCTURES BY 5' AND SANITARY SEWER STRUCTURES AND MAINS BY 10'. WATER MAINS SHALL VERTICALLY CLEAR STORM SEWER STRUCTURES AND SANITARY SEWER MAINS BY 18".
15. MAXIMUM TRENCH WIDTH SHALL NOT EXCEED MANUFACTURER'S RECOMMENDATIONS. MAXIMUM TRENCH WIDTH IS DEFINED AS THE HORIZONTAL PLANE MEASURED 6" ABOVE THE TOP OF PIPE, PERPENDICULAR TO THE SEWER ALIGNMENT.



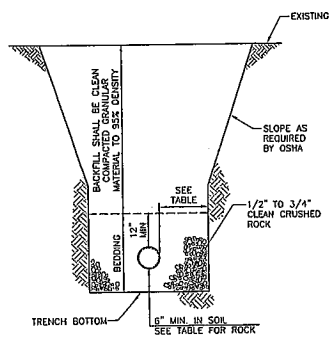
SHALLOW MANHOLE
N.T.S.

NOTES:

1. ALL UTILITIES, PUBLIC OR PRIVATE, THAT FALL WITHIN A ONE ON ONE ZONE OF INFLUENCE FROM A POINT 5'-0" BEHIND BACK OF CURB AT TOP OF CURB SHALL BE BACKFILLED WITH KDOT GRANULAR MATERIAL COMPACTED TO 95% OF MAXIMUM DENSITY UTILIZING ASTM D-1557.
2. BACKFILL SHALL BE FREE OF ROCKS LESS THAN 2" COMPACTED TO 95% OF MAXIMUM DENSITY. FLOWABLE FILL MAY BE ALLOWED SUBJECT TO APPROVAL OF THE CITY ENGINEER ON A CASE PER CASE BASIS.



6" HOUSE LEAD CONSTRUCTION
N.T.S.



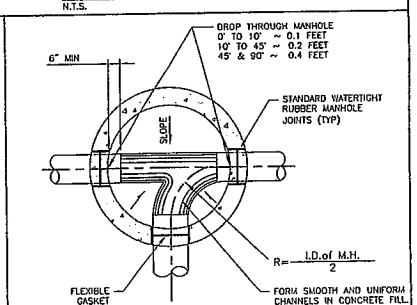
TYP PIPE ENVELOPE (PVC)

MINIMUM TRENCH WIDTHS AND PIPE CLEARANCES (IN)			
NOMINAL PIPE DIAMETER	TRENCH WIDTH	PIPE SIDE CLEARANCE (SOIL/ROCK)	PIPE BOTTOM CLEARANCE (SOIL/ROCK)
8	22	6/6	6/6
10	30	6/6	6/6
24	36	6/6	6/6
30	48	8/9	6/9
36	72	12/12	6/9

NOTES:

1. ALL EXCAVATION SHALL BE UNCLASSIFIED.
2. TRENCH BANKS SHALL BE CUT BACK ON SLOPES IN ACCORDANCE WITH CURRENT OSHA REGULATIONS. SLOPES MUST NOT EXTEND BELOW TOP OF BEDDING.
3. MAXIMUM TRENCH WIDTH SHALL NOT EXCEED MANUFACTURER'S RECOMMENDATIONS. MAXIMUM TRENCH WIDTH IS DEFINED AS THE HORIZONTAL PLANE MEASURED 6" ABOVE THE TOP OF PIPE, PERPENDICULAR TO THE SEWER ALIGNMENT.

UNDERGROUND PIPE INSTALLATION FOR SANITARY SEWER LINES
N.T.S.



TYPICAL INVERT
N.T.S.

CITY OF JUNCTION CITY, KANSAS

SANITARY SEWER DETAILS

MUNICIPAL SERVICES DIRECTOR	DATE:
GREGORY S. McCAFFERY, P.E.	10/08/2013

ENGINEERING DEPARTMENT
700 N JEFFERSON
JUNCTION CITY, KS 66441
(785) 238-3103

DESIGN: –
DRAWN: –

SHEET 1 OF 2

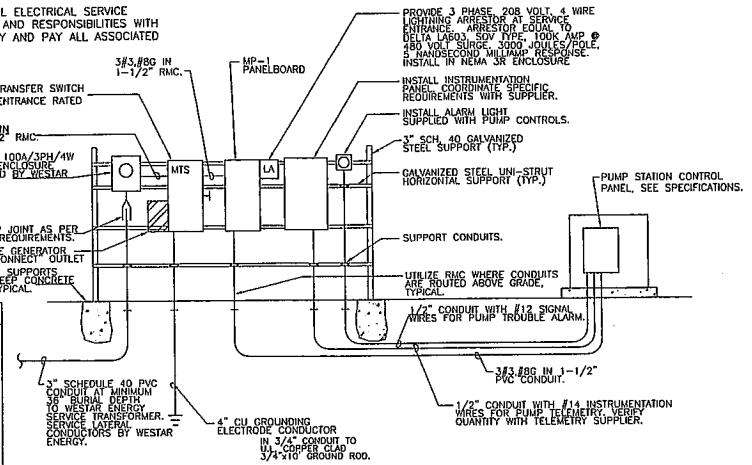
ELECTRICAL EQUIPMENT SCHEDULE

PANELBOARD
MP-1
120/208 VOLT PANELBOARD, 100 AMPERE MCB, 3 PHASE, 3 WIRE, NEMA 3R ENCLOSURE, 18,000 AIC. EQUIVALENT TO SQUARE D NF WITH E FRAME BRANCH BREAKERS.

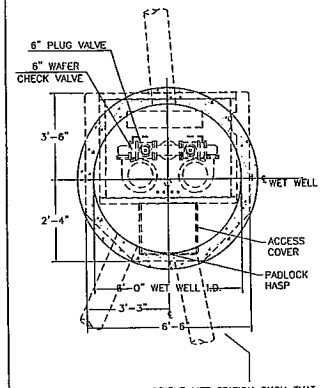
CKT NO.	C/B	LOAD	WIRE
1	100/3	PUMP PANEL	3-#3,#6G
2	15/2	TRANSFORMER	2-#12,#12G

MANUAL TRANSFER SWITCH
MTS
MANUAL TRANSFER SWITCH - SERVICE ENTRANCE RATED DOUBLE THROW SWITCH, 100 AMPERE, 120/208 VOLT, 3-POLE, 4 WIRE, U.L. LISTED, NEMA 3R ENCLOSURE, EQUIVALENT TO SQUARE D F-SERIES DTU.

NOTE:
COORDINATE ALL ELECTRICAL SERVICE REQUIREMENTS AND RESPONSIBILITIES WITH WESTAR ENERGY AND PAY ALL ASSOCIATED FEES

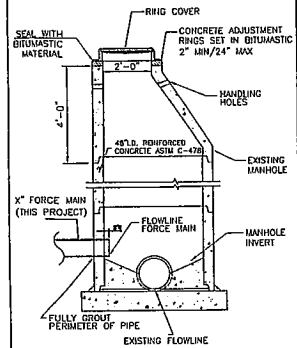


ELECTRICAL RISER DIAGRAM
N.T.S.



ORIENT LIFT STATION SUCH THAT SEWER MAIN IS ACCESSIBLE FROM THE ACCESS COVER

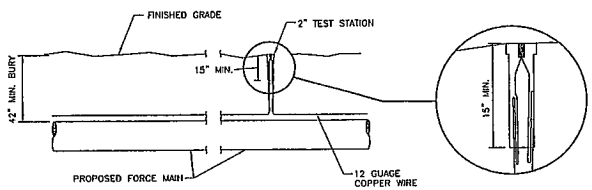
PLAN VIEW
(SHOWN LESS HOOD)
N.T.S.



EXISTING MANHOLE CONNECTION
N.T.S.

ELECTRICAL SPECIFICATION NOTES

1. THIS CONTRACTOR SHALL PAY ALL FEES, GIVE ALL NOTICES, FILE ALL NECESSARY DRAWINGS AND OBTAIN ALL PERMITS AND CERTIFICATES OF APPROVAL REQUIRED IN CONNECTION WITH ALL WORK.
2. THE DRAWINGS ARE A SCHEMATIC REPRESENTATION OF WHAT IS TO BE ACCOMPLISHED FOR A TYPICAL SANITARY LIFT STATION CONTRACT. IT IS THE RESPONSIBILITY OF THIS CONTRACTOR TO THOROUGHLY INVESTIGATE THE SITE FOR CLEARANCE AND WORK OF OTHERS THAT MAY INTERFERE WITH HIS WORK AND TO COORDINATE HIS WORK WITH ALL TRADES.
3. ALL WORK SHALL BE GUARANTEED FOR TWO (2) YEARS AGAINST LABOR AND MATERIALS, FROM THE DATE OF ACCEPTANCE OF THE COMPLETED WORK BY THE OWNER.
4. ALL EQUIPMENT SHALL BE CLEANED TO THE SATISFACTION OF THE CITY ENGINEER.
5. EQUIPMENT CAPACITIES AND CHARACTERISTICS SHALL BE AS SCHEDULED ON THE DRAWINGS. SUBSTITUTIONS OF EQUIVALENT QUALITY AND CAPACITY MUST BE APPROVED BY THE CITY ENGINEER. INSTALL ALL EQUIPMENT IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
6. LOCATIONS OF CONNECTIONS TO SITE UTILITIES ARE APPROXIMATE AND SHALL BE VERIFIED BY THIS CONTRACTOR. COORDINATE ALL REQUIREMENTS, RESPONSIBILITIES AND FEES WITH THE CITY OR UTILITY COMPANY, AS APPLICABLE.
7. STORE MATERIALS IN SPACES DESIGNATED BY THE OWNER. REMOVE RUBBISH FROM PREMISES AS OFTEN AS DIRECTED OR AS NECESSARY TO ENSURE SAFE AND NEAT WORKING CONDITIONS.
8. ASSUME ALL COSTS FOR EXCAVATION, CUTTING AND PATCHING REQUIRED TO COMPLETE THE INSTALLATION. SURFACES SHALL BE PATCHED TO MATCH THE CONDITION OF ADJACENT SURFACES, TO THE SATISFACTION OF THE CITY ENGINEER.
9. TEST ALL CIRCUITS TO ASSURE THEM TO BE FREE OF GROUNDS BEFORE ENERGIZING.
10. WIRE AND CABLE SHALL CONFORM TO THE REQUIREMENTS OF THE LATEST ADOPTED NATIONAL ELECTRICAL CODE BY THE CITY OF JUNCTION CITY AND APPLICABLE ASTM SPECIFICATIONS. CONDUITS AND FITTINGS SHALL BE UL LISTED FOR THE APPLICATION AND LOCATION USED.
11. ALL NEW PANEL AND CABLE CONDUCTORS SHALL BE COPPER. PROVIDE A GREEN EQUIPMENT GROUND CONDUCTOR FOR EACH CIRCUIT AND TERMINATE IN APPROVED MANNER WITH U.L. LISTED CONNECTORS.

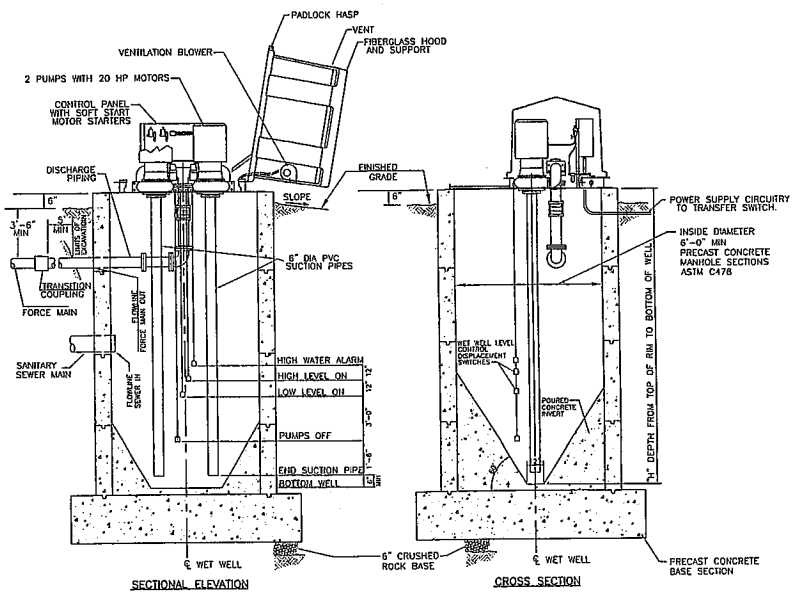


TRACER WIRE
THE WIRE SHALL EXTEND THE ENTIRE LENGTH OF THE PROPOSED PIPE. SPLIT-BOLT CONNECTORS SHALL BE USED AT SPLICE LOCATIONS. ELECTRICAL TAPE SHALL COVER ALL SPLICES SO NO BARE WIRE IS EXPOSED. TEST STATIONS SHALL BE INSTALLED NEAR MANHOLES AT EITHER END OF THE FORCE MAIN. ANY EXCEPTIONS TO THE LOCATION OF TEST STATIONS SHALL BE APPROVED BY THE ENGINEER. A TYPICAL LAYOUT OF THE TRACER WIRE AND TEST STATION IS PROVIDED IN THE ABOVE FIGURE.

WIRE
THE TRACER WIRE SHALL BE GREEN 12 GAUGE SINGLE STRAND COPPER WIRE WITH INSULATION. THE INSULATION SHALL BE HEAT, OIL, AND GASOLINE RESISTANT. TO ALLOW FOR GRADE ADJUSTMENT, A MINIMUM OF 12" OF EXCESS WIRE SHALL BE COILED AT THE BOTTOM OF THE TEST STATION FOR ALL WIRES. THE INSULATION SHEATHING SHALL BE REMOVED SUCH THAT 1" BARE COPPER WIRE IS EXPOSED AT ALL POINTS OF CONNECTION.

TEST STATIONS
THE TEST STATION SHALL BE 2 INCH FLUSH STYLE TEST STATION T2PS3B AS MANUFACTURED BY HANDLEY INDUSTRIES OR APPROVED EQUAL. ALL TEST STATIONS SHALL BE MANUFACTURED USING MOLDED GREEN TOPS OR SUFFICIENTLY COATED WITH GREEN ENAMEL PAINT. THE LOCATION OF ALL TEST STATIONS SHALL BE APPROVED BY THE ENGINEER, RECORDED, AND SHOWN IN THE AS-BUILT DRAWINGS.

TRACER WIRE DETAIL
N.T.S.



SECTIONAL ELEVATION

CROSS SECTION

PUMP STATION
N.T.S.

LIFT STATION GENERAL NOTES:

1. THE DRAWINGS FOR THE PUMP STATION WERE PROVIDED BY SMITH AND LOVELESS INC. DESIGN AND INVENTION RIGHTS ARE RESERVED.
2. EACH PUMP SHALL BE CAPABLE OF PUMPING XXX GPM AT XX.X FEET OF HEAD PLUS LOSSES WITHIN THE LIFT STATION ITSELF. PUMP MOTORS SHALL NOT EXCEED 20 HP. THE PUMP STATION CONTROL PANEL SHALL BE PROVIDED WITH START MOTOR STARTERS TO PROVIDE SOFT STARTING AND STOPPING CAPABILITIES TO THE PUMPS.
3. OTHER PUMP STATION MANUFACTURERS THAT ARE APPROVED FOR USE IN THE CITY OF JUNCTION CITY ARE GORMAN-RUPP AND HFE PROCESS.
4. THE CONTRACTOR SHALL COORDINATE ELECTRICAL SERVICE WITH O, S & O OR WESTAR. THE POWER SOURCE AVAILABLE WILL BE 120/208 VOLT, THREE PHASE, 4 WIRE, UNDERGROUND ELECTRIC SERVICE. THE ELECTRICAL PROVIDER WILL SET A TRANSFORMER AT THE UTILITY EASEMENT. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO INSTALL AN UNDERGROUND SCH 40 (UL LISTED) GRAY ELECTRICAL GRADE PVC CONDUIT WITH PULL ROPE FROM THE TRANSFORMER TO A UNI-STRUT METER RACK AT THE LIFT STATION. THE CONDUIT SHALL BE 3" DIA. WITH 24" MIN. RADIUS ELBOWS, BURIED WITH 36" OF COVER. THE METER RACK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS ON THIS SHEET. THE METER SOCKET WILL BE PROVIDED BY THE ELECTRICAL PROVIDER BUT MUST BE INSTALLED BY THE CONTRACTOR.
5. THE PUMP STATION SHALL BE EQUIPPED WITH AN ALARM THAT CAN COMMUNICATE WITH EQUIPMENT AT THE CITY'S WASTEWATER TREATMENT PLANT. THE PUMP STATION RTU SHALL BE A SIEMENS LC 2000 CONTROLLER. THE RTU SHALL BE MOUNTED IN A NEMA 4X ENCLOSURE AND SHALL MONITOR AND REPORT BACK VIA A DEDICATED CIRCUIT PHONE LINE TO THE CITY OF JUNCTION CITY, KS WWTP MASTER TERMINAL UNIT AND INTEGRATE THE ALARMS INTO THE FOXBORO I/A COMPUTER SYSTEM. THE RTU WILL MONITOR THE FOLLOWING I/O POINTS: POWER FAILURE, COMMUNICATION FAILURE, HIGH WET WELL LEVEL, PUMP 1 RUN, PUMP 2 RUN, PUMP 1 FAILURE, PUMP 2 FAILURE. THE CONTRACTOR SHALL ARRANGE FOR PHONE SERVICE TO BE PROVIDED TO THE SITE.
6. THE CONTRACTOR SHALL COORDINATE THE CONNECTION OF THE ALARM SYSTEM TO THE CITY'S SCADA SYSTEM.
7. THE FORCE MAIN SHALL BE INSTALLED WITH TRACER WIRE.

CITY OF JUNCTION CITY, KANSAS

SANITARY SEWER DETAILS

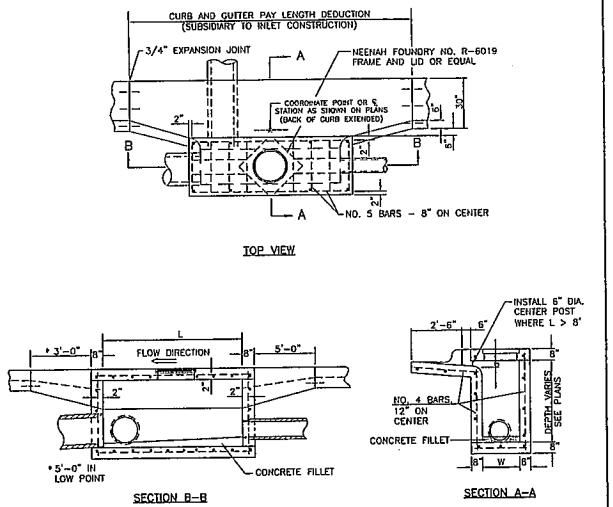
MUNICIPAL SERVICES DIRECTOR	DATE:
GREGORY S. McCAFFERY, P.E.	10/08/2013

ENGINEERING DEPARTMENT
700 N JEFFERSON
JUNCTION CITY, KS 66441
(785) 238-3103

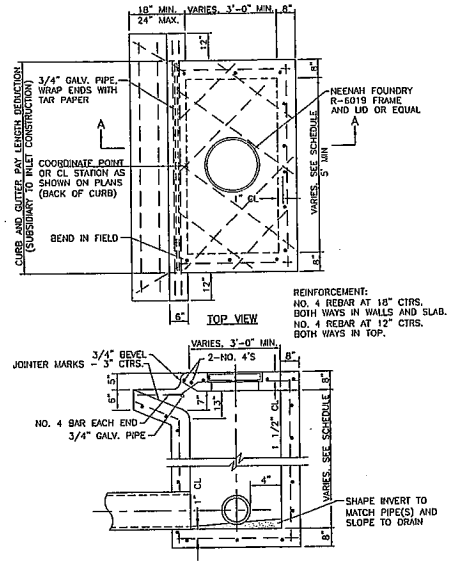
DESIGN: –
DRAWN: –

SHEET 2 OF 2

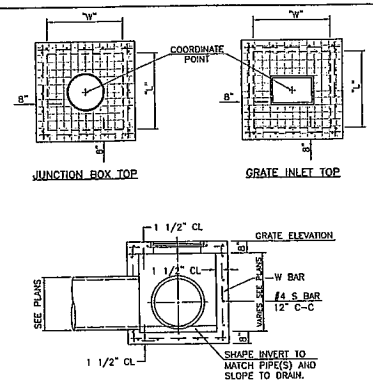
103



SETBACK CURB INLET
N.T.S.



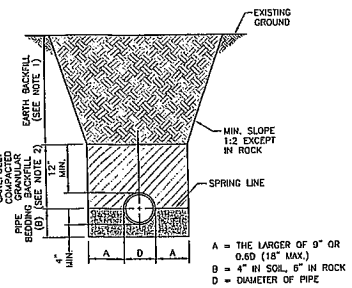
NON-SETBACK CURB INLET
N.T.S.



L OR W	S BARS
≤ 4'	#4@6"
4-6'	#5@6"
6-8'	#6@6"
H	**W BARS**
≤ 5'	#4@12"
5-8'	#5@8"
8-12'	#6@6"

MIN. BOX SIZE:
3.5' X 4.0' FOR SINGLE GRATE &
4.0' X 5.5' FOR DOUBLE GRATE

GRATE INLET OR JUNCTION BOX
N.T.S.

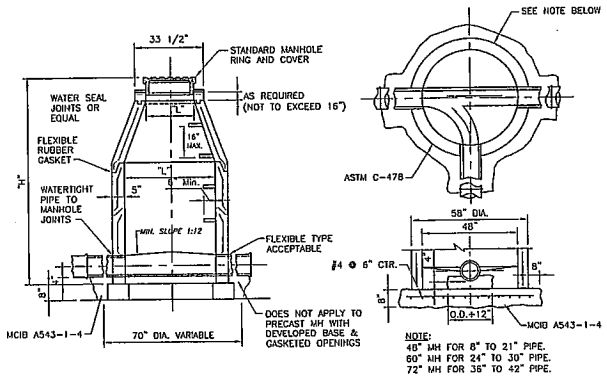


NOTES:

1. BACKFILL MATERIAL SHALL BE EARTH FILL TO 95% OF MAXIMUM DENSITY WHEN UNDER AREA TO BE PAVED, 90% OF MAXIMUM DENSITY IN OTHER AREAS.
2. GRANULAR BEDDING MATERIAL OR HAND COMPACTED SOIL – 90% OF MAXIMUM DENSITY USING ASTM D 698. MAXIMUM LIFT THICKNESS 6". GRANULAR BEDDING MATERIAL SHALL BE USED FOR ALL PIPE EXCEPT REINFORCED CONCRETE PIPE.

   BEDDING MATERIAL SHALL MEET THE FOLLOWING GRADATION:
   100% PASSING 3/8" SIEVE
   30-40% PASSING #4 SIEVE
   0-4% PASSING #10 SIEVE

STORM SEWER BEDDING
N.T.S.

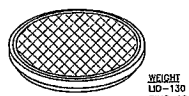


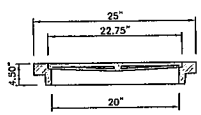
NOTE:
48" MH FOR 8" TO 21" PIPE.
60" MH FOR 24" TO 30" PIPE.
72" MH FOR 36" TO 42" PIPE.

NOTES:

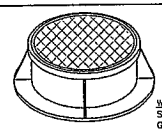
1. A MINIMUM OF 0.20' DROP REQUIRED BETWEEN INVERTS.
2. APPLY 2 COATS WATERPROOFING SEAL.
3. MUST MEET ASTM C-478.

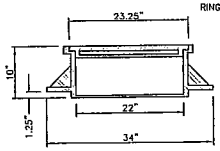
STANDARD STORM MANHOLE
N.T.S.



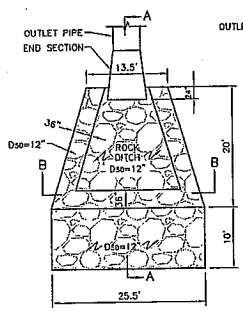


STANDARD INLET RING AND COVER
NEENAH R-6019 OR APPROVED EQUAL.





STANDARD MANHOLE RING AND COVER
NEENAH 1736* OR APPROVED EQUAL.
*NEENAH R-2421-A GRATED LID MAY BE USED IN GRASSED AREAS.



THE MOUNDED DAM ON THE ROCK CHECK SHALL BE FULL DEPTH D50=12" STONE, ALL OTHER PORTIONS OF THE CHECK SHALL BE D50=6" STONE.

STORM SEWER RIPRAP APRON
N.T.S.

GENERAL STORM SEWER NOTES:

1. THE WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF JUNCTION CITY.
2. IT SHALL BE THE OWNER'S ENGINEER AND CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES.
3. ALL SEWER TRENCHES UNDER THE 45 DEGREE ZONE OF INFLUENCE LINE OF EXISTING OR PROPOSED PAVEMENTS, BIKE PATHS, SIDEWALKS OR DRIVE APPROACHES SHALL BE BACKFILLED WITH KDOT AB3 GRANULAR MATERIAL COMPACTED TO AT LEAST 95% OF MAXIMUM DENSITY.
4. JOINTS FOR STORM SEWER SHALL BE PREMIUM JOINTS (TONGUE AND GROOVE WITH RUBBER GASKETS).
5. USE 3500 P.S.I. CONCRETE IN SIDE WALL AND SLAB.
6. PROVIDE 3/4" ROUNDED EDGE ON ALL EXPOSED CORNERS.
7. WHERE INLETS ARE SET IN CURVES, FORM FRONT WALL TO CONFORM TO CURVE.
8. PRE-CAST UNITS MAY BE SUBSTITUTED WITH THE ENGINEERS APPROVAL. SHOP DRAWINGS AND DESIGN CALCULATIONS MUST BE SUBMITTED.
9. THE TOP OF THE INLET SHALL BE SLOPED TO FIT STREET, SIDEWALK, OR FINISHED GROUND ELEVATIONS.

CITY OF JUNCTION CITY, KANSAS

STORM SEWER DETAILS

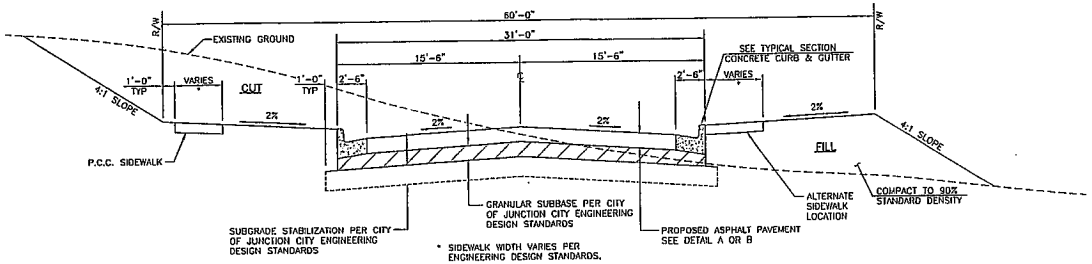
MUNICIPAL SERVICES DIRECTOR
GREGORY S. McCAFFERY, P.E.

DATE:
10/08/2013

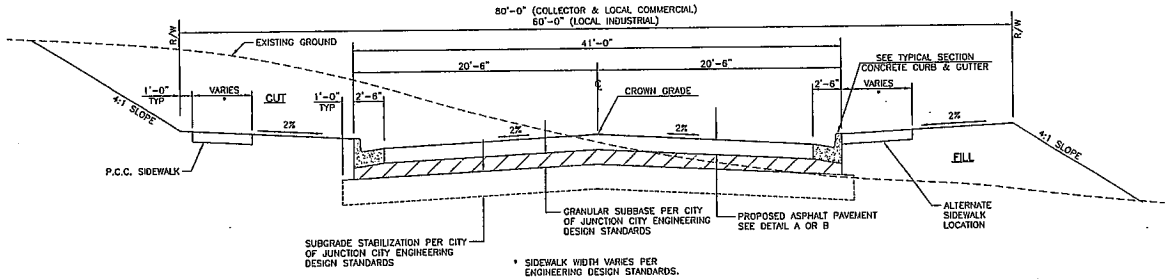
ENGINEERING DEPARTMENT
700 N JEFFERSON
JUNCTION CITY, KS 66441
(785) 238-3103

DESIGN: --
DRAWN: --

SHEET 1 OF 1

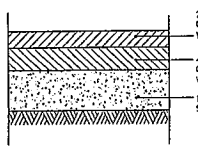


BITUMINOUS PAVEMENT SECTION
LOCAL RESIDENTIAL STREETS
N.T.S.

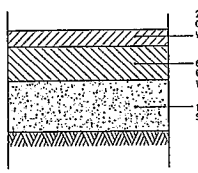


BITUMINOUS PAVEMENT SECTION
COLLECTOR, LOCAL COMMERCIAL & LOCAL INDUSTRIAL
N.T.S.

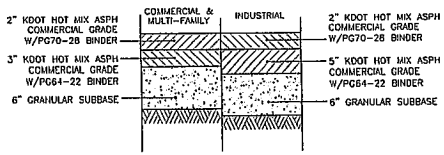
105



DETAIL A
LOCAL COMMERCIAL/RESIDENTIAL



DETAIL B
INDUSTRIAL/COLLECTOR/ARTERIAL

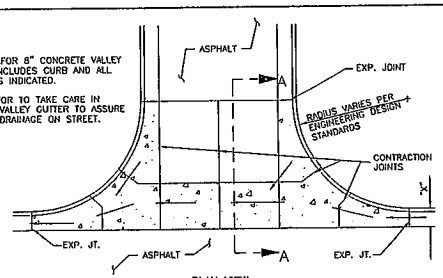


DETAIL C
PARKING LOT PAVEMENT

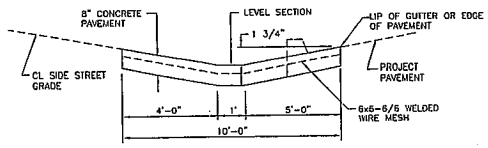
TYPICAL BITUMINOUS SECTIONS
N.T.S.

NOTES:

1. BID ITEM FOR 8" CONCRETE VALLEY GUTTER INCLUDES CURB AND ALL PAVING AS INDICATED.
2. CONTRACTOR TO TAKE CARE IN GRADING VALLEY GUTTER TO ASSURE POSITIVE DRAINAGE ON STREET.

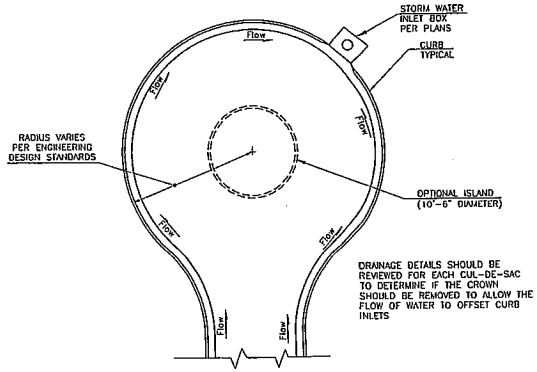


PLAN VIEW

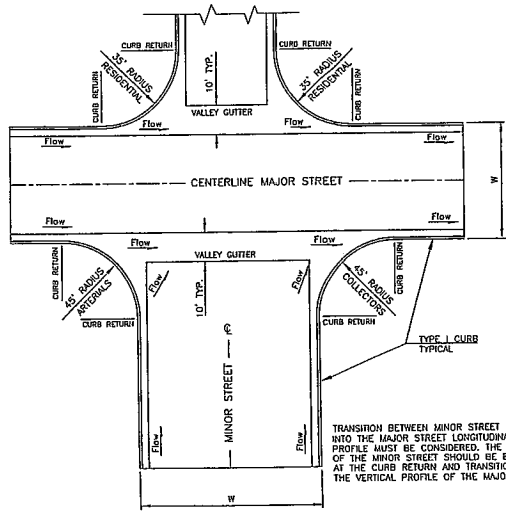


SECTION A-A

VALLEY GUTTER
(ASPHALT PAVEMENT)
N.T.S.



DRAINAGE DETAILS SHOULD BE REVIEWED FOR EACH CUL-DE-SAC TO DETERMINE IF THE CROWN SHOULD BE REMOVED TO ALLOW THE FLOW OF WATER TO OFFSET CURB INLETS



TRANSITION BETWEEN MINOR STREET DRAINAGE INTO THE MAJOR STREET LONGITUDINAL PROFILE MUST BE CONSIDERED. THE CROWN OF THE MINOR STREET SHOULD BE ELIMINATED AT THE CURB RETURN AND TRANSITION INTO THE VERTICAL PROFILE OF THE MAJOR STREET.

"W" *	"H"	CROSS SLOPE
31	.29	2.0%
37	.35	2.0%
41	.35	1.8%
45	.39	1.8%
49	.42	1.8%

* WIDTH IS MEASURED FROM BACK OF CURB TO BACK OF CURB.

TYPICAL LAYOUT FOR BITUMINOUS ASPHALT PAVEMENT
N.T.S.

CITY OF JUNCTION CITY, KANSAS

BITUMINOUS PAVEMENT DETAILS

MUNICIPAL SERVICES DIRECTOR
GREGORY S. McCAFFERY, P.E.

DATE:
10/08/2013

ENGINEERING DEPARTMENT
700 N JEFFERSON
JUNCTION CITY, KS 66441
(785) 238-3103

DESIGN: –
DRAWN: –

SHEET 1 OF 1

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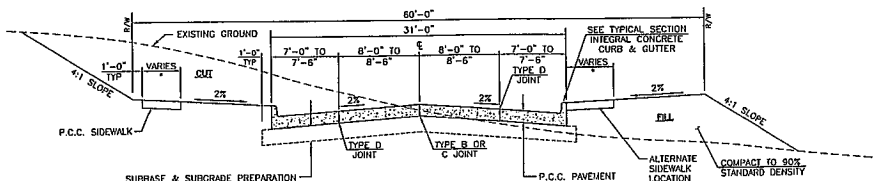
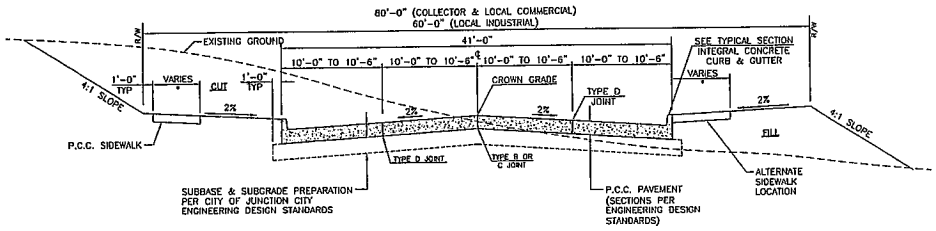
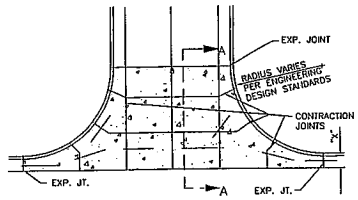


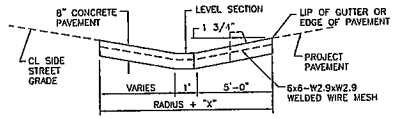
CONCRETE PAVEMENT SECTION
LOCAL RESIDENTIAL STREETS
N.T.S.



CONCRETE PAVEMENT SECTION
COLLECTOR, LOCAL COMMERCIAL & LOCAL INDUSTRIAL
N.T.S.



PLAN VIEW

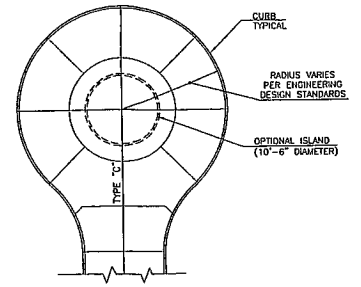


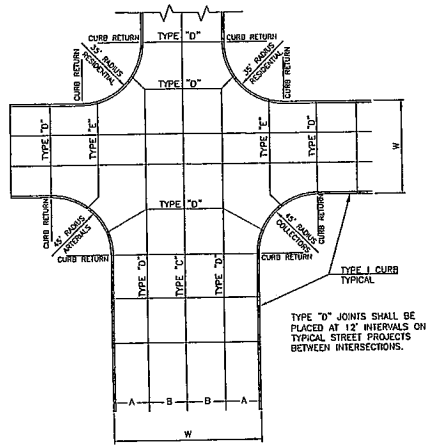
SECTION A-A

NOTES:

1. BID ITEM FOR 8" CONCRETE VALLEY GUTTER INCLUDES CURB AND ALL PAVING AS INDICATED.
2. CONTRACTOR TO TAKE CARE IN GRADING VALLEY GUTTER TO ASSURE POSITIVE DRAINAGE ON STREET.

VALLEY GUTTER
(CONCRETE PAVEMENT)
N.T.S.





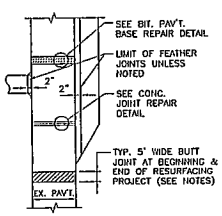
TYPE "D" JOINTS SHALL BE PLACED AT 12' INTERVALS ON TYPICAL STREET PROJECTS BETWEEN INTERSECTIONS.

"W"*	"A"	"B"	"H"	CROSS SLOPE
31	2 @ 7.75'	2 @ 7.75'	.29	2.0%
37	2 @ 10.5'	2 @ 12.0'	.35	2.0%
41	2 @ 9.0'	2 @ 11.5'	.35	1.8%
45	2 @ 10.5'	2 @ 12.0'	.39	1.8%
49	2 @ 12.0'	2 @ 12.5'	.42	1.8%

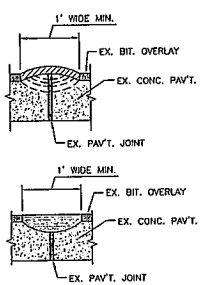
* WIDTH IS MEASURED FROM BACK OF CURB TO BACK OF CURB.

TYPICAL LAYOUT FOR CONCRETE PAVEMENT
MONOLITHIC OR COMBINE CURB & GUTTER
N.T.S.

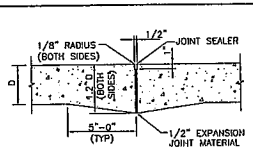
NOTE:
SAWCUT AND REMOVE ASPHALT OVERLAY AND LOOSE SPALLED CONCRETE AROUND JOINT. CLEAN SURFACE AND PLACE BITUMINOUS BOND COAT AND MATERIAL TO EXISTING SURFACE AND COMPACT AS DIRECTED BY ENGINEER.



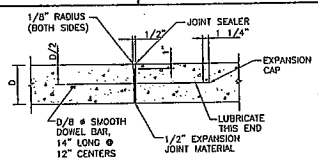
TYPICAL JOINT DETAIL
N.T.S.



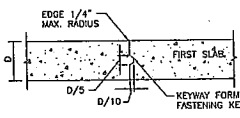
CONCRETE JOINT REPAIR
N.T.S.



EXPANSION JOINT
TYPE "A"

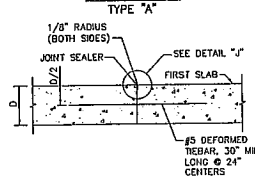


DOWELED EXPANSION JOINT
TYPE "A-D"

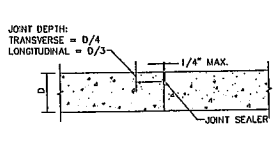


* AVAILABLE KEYS MAY VARY.

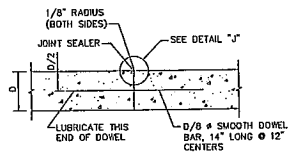
LONGITUDINAL CONSTRUCTION JOINT
TYPE "B"



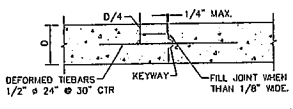
TIED LONGITUDINAL CONSTRUCTION JOINT
TYPE "C"



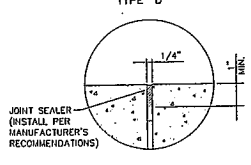
SAWED CONTRACTION JOINT
TYPE "D"



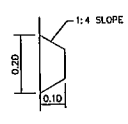
PLANNED TRANSVERSE CONSTRUCTION JOINT
TYPE "E"



(USED AT MIDDLE THIRD OF NORMAL JOINT SPACING)
EMERGENCY TIED TRANSVERSE CONSTRUCTION JOINT
TYPE "F"



DETAIL J
CONCRETE PAVEMENT JOINT DETAILS
N.T.S.

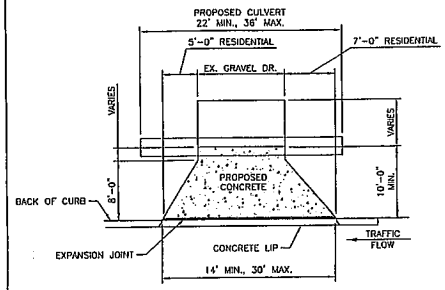


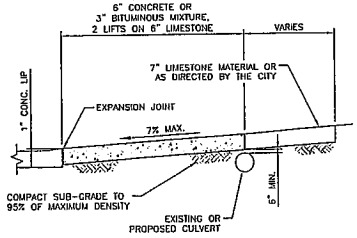
KEYWAYS FOR TYPE B AND F
CONSTRUCTION JOINTS

CITY OF JUNCTION CITY, KANSAS

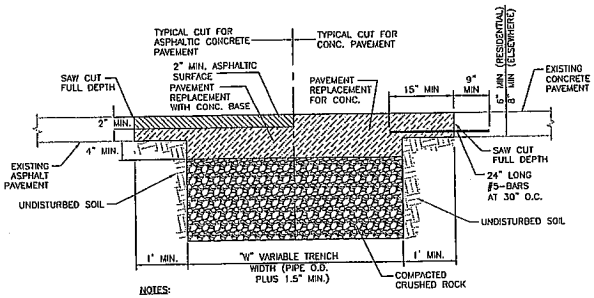
CONCRETE PAVEMENT DETAILS

MUNICIPAL SERVICES DIRECTOR GREGORY S. McCAFFERY, P.E.	DATE: 10/08/2013
ENGINEERING DEPARTMENT 700 N JEFFERSON JUNCTION CITY, KS 66441 (785) 238-3103	DESIGN: – DRAWN: –
	SHEET 1 OF 1





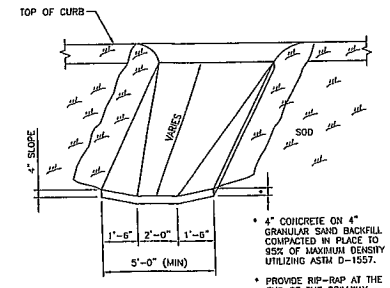
RESIDENTIAL DRIVEWAY
N.T.S.



NOTES:

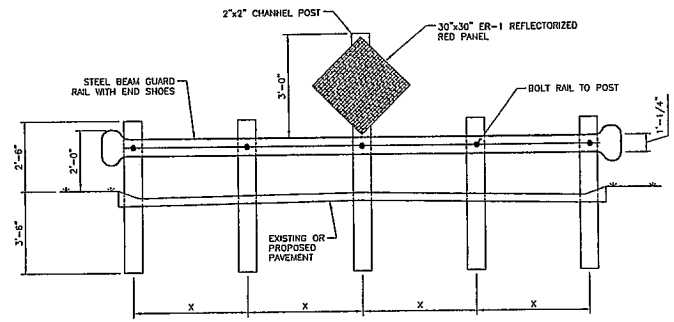
1. ROCK BACKFILL SHALL BE 3/4" CRUSHED STONE OR KDOT AB3.
2. CONCRETE: F'c = 3500 PSI, AIR-ENTRAINED.
3. ASPHALTIC CONCRETE SURFACE SHALL BE PER CITY ENGINEERING DESIGN STANDARDS.

STREET CUT RESTORATION (ASPHALT OR CONCRETE)
N.T.S.



- 4" CONCRETE ON 4" GRANULAR SAND BACKFILL COMPACTED IN PLACE TO 95% OF MAXIMUM DENSITY UTILIZING ASTM D-1557.
- PROVIDE RIP-RAP AT THE END OF THE SPILLWAY.

CONCRETE SPILLWAY
N.T.S.

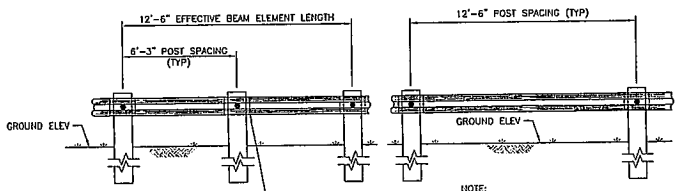


NOTES:

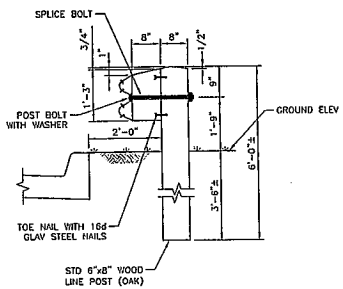
1. STEEL W6x9 x 6'-0" MAY REPLACE OAK POST.
2. CHANNEL TO BE BOLTED TO OAK POSTS.
3. GUARD RAIL & FITTINGS TO CONFORM TO KDOT STANDARDS.

WIDTH OF PAVEMENT	X	NO. OF POSTS
31' B/B	6'-0"	5
ALL OTHERS B/B	5'-6"	7

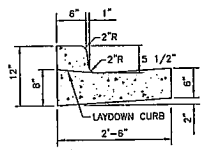
ROAD END STEEL BEAM GUARD RAIL
N.T.S.



NOTE:
GUARDRAIL, END SECTIONS AND REFLECTORIZED WASHER MATERIALS SHALL CONFORM WITH KDOT STANDARDS

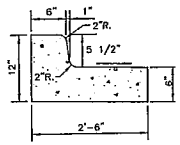


BEAM GUARDRAIL - TYPE "B"
N.T.S.

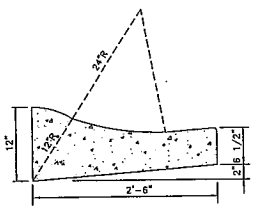


ALL WHEEL CHAIR RAMPS, ALLEY ENTRANCES AND DRIVEWAYS TO HAVE LAYDOWN CURBS AS SHOWN, SEE SIDEWALK AND DRIVEWAY DETAILS FOR VARIATIONS.

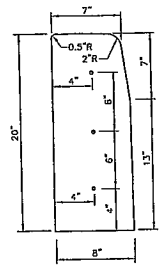
CONCRETE CURB & GUTTER
N.T.S.



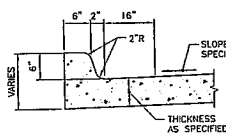
CONCRETE CURB & GUTTER WITH REVERSE FLOW IN GUTTER
N.T.S.



MOUNTABLE CONCRETE CURB & GUTTER
N.T.S.



STRAIGHT CURB
N.T.S.



ALL WHEEL CHAIR RAMPS, ALLEY ENTRANCES AND DRIVEWAYS TO HAVE LAYDOWN CURBS AS SHOWN, SEE SIDEWALK AND DRIVEWAY DETAILS FOR VARIATIONS.

INTEGRAL CONCRETE CURB & GUTTER
N.T.S.

CITY OF JUNCTION CITY, KANSAS

DRIVEWAY AND GENERAL DETAILS

MUNICIPAL SERVICES DIRECTOR
GREGORY S. McCAFFERY, P.E.

DATE: 10/08/2013

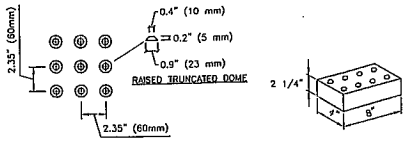
ENGINEERING DEPARTMENT
700 N JEFFERSON
JUNCTION CITY, KS 66441
(785) 238-3103

DESIGN: --
DRAWN: --

SHEET 1 OF 1

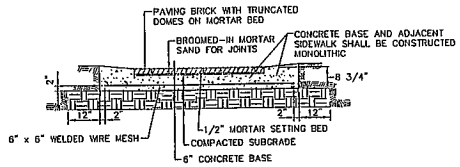
GENERAL NOTES:

1. DETAILS SHOWN ON THIS PLAN APPLY TO ALL CONSTRUCTION OR RECONSTRUCTION OF STREETS, CURBS OR SIDEWALKS.
2. CURB CUT RAMPS ARE TO BE LOCATED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE CITY ENGINEER.
3. RAMPS SHALL BE PROVIDED AT ALL CORNERS OF STREET INTERSECTIONS WHERE THERE IS EXISTING OR PROPOSED SIDEWALK AND CURB.
4. SURFACE TEXTURE OF THE RAMP SHALL CONSIST OF RAISED TRUNCATED DOMES WITH A DIAMETER OF NOMINAL 0.9 in, A HEIGHT OF NOMINAL 0.2in AND A CENTER-TO-CENTER SPACING OF NOMINAL 2.35in.
5. SIDEWALKS SHALL BE RAMPED WHERE THE DRIVEWAY CURB IS EXTENDED ACROSS THE WALK.
6. CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE RAMP, FREE OF SAGS AND SHORT GRADE CHANGES.
7. IF POSSIBLE, DRAINAGE STRUCTURES SHOULD NOT BE PLACED IN LINE WITH THE RAMP, EXCEPT WHERE EXISTING DRAINAGE STRUCTURES ARE BEING UTILIZED IN THE NEW CONSTRUCTION.
8. THE LOCATION OF THE RAMP SHOULD TAKE PRECEDENCE OVER THE LOCATION OF DRAINAGE STRUCTURES.
9. USE OF SIDEWALK RAMP TYPE 2 SHALL BE RESTRICTED TO LOCATIONS WHERE IT IS NOT FEASIBLE TO USE TYPE 1 OR TYPE 3 RAMPS.
10. THE NORMAL GUTTER LINE PROFILE SHALL BE MAINTAINED THROUGH THE AREA OF THE RAMP.
11. SIDEWALK RAMPS THAT ARE CONSTRUCTED WITHIN THE ENDS OF THE CURB RETURNS AT INTERSECTIONS SHALL BE CONSTRUCTED OF 6" NON-REINFORCED CONCRETE.
12. IN FLUSH RUNS, EXPANSION JOINTS SHALL BE 1/2" PRE-MOLDED EXPANSION MATERIAL, FLUSH WITH THE SURFACE AND AT A MAXIMUM SPACING OF 125".
13. THIS SAME JOINT SHALL BE USED AT SIDEWALK JUNCTIONS AS SHOWN IN TYPICAL PLAN.
14. WHERE THE SIDEWALK IS PARALLEL AND ADJACENT TO A RIGID STRUCTURE, A 1/2" PRE-MOLDED EXPANSION MATERIAL FLUSH WITH THE SURFACE SHALL BE USED.
15. SIDEWALKS SHALL SLOPE TO MATCH EXISTING DRAINAGE PATTERNS. THE RATE OF CROSS-SLOPE IS 1:50 MAX.
16. WHERE SIDEWALK IS SHOWN TO BE CONSTRUCTED THROUGH AN ENTRANCE, IT SHALL BE 6" THICK AND MAINTAIN 1:50 CROSS-SLOPE.
17. ADA TRUNCATED DETECTABLE DOMES AT SIDEWALK RAMPS SHALL BE A MANUFACTURED BRICK PAVER. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. COLOR SHALL BE APPROVED BY THE CITY ENGINEER.

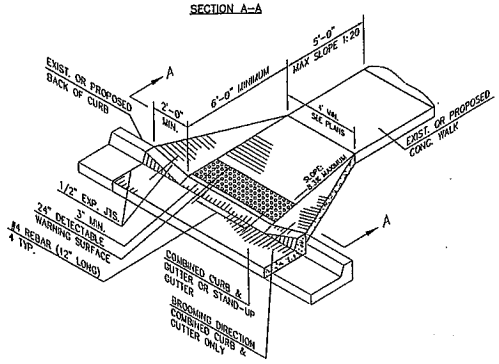


DETECTABLE WARNING SURFACE PATTERN

PAVER BRICK WITH TRUNCATED DOME SURFACE

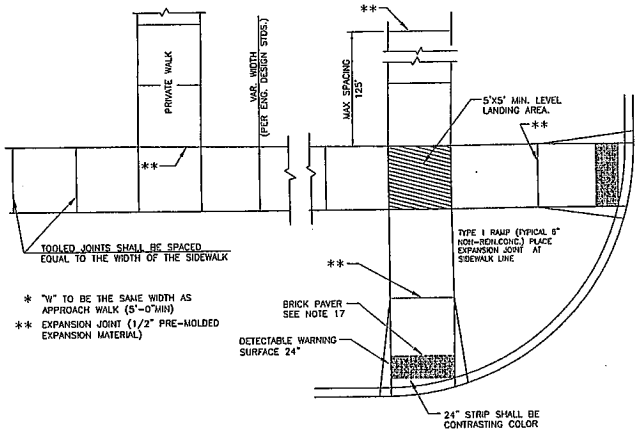


SECTION A-A



ISOMETRIC OF RAMP WITH PERPENDICULAR WALK SHOWN

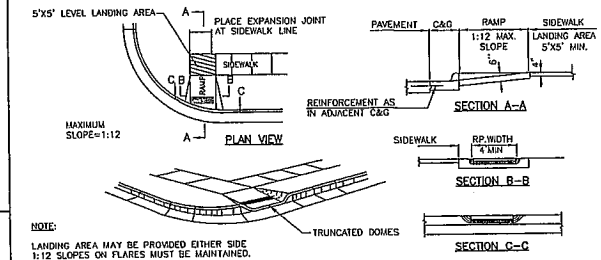
SIDEWALK RAMP
N.T.S.



* "W" TO BE THE SAME WIDTH AS APPROACH WALK (5'-0"MIN)

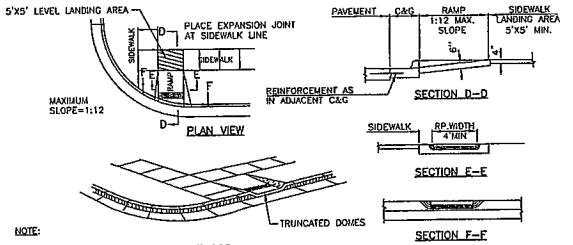
** EXPANSION JOINT (1/2" PRE-MOLDED EXPANSION MATERIAL)

TYPICAL PLAN
N.T.S.



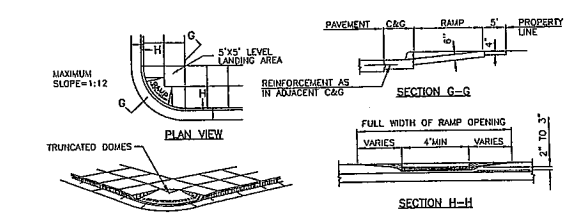
NOTE:
LANDING AREA MAY BE PROVIDED EITHER SIDE
1:12 SLOPES ON FLARES MUST BE MAINTAINED.

SIDEWALK RAMP TYPE 1
N.T.S.



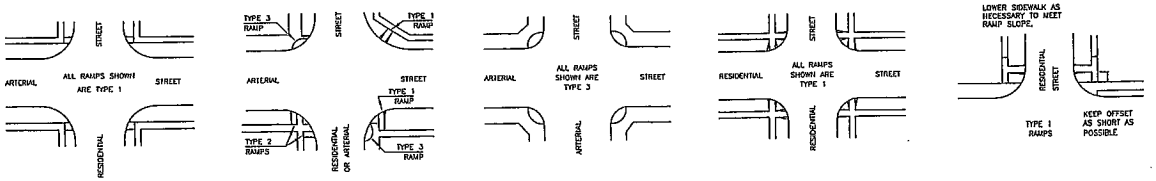
NOTE:
LANDING AREA MAY BE PROVIDED EITHER SIDE
1:12 SLOPES ON FLARES MUST BE MAINTAINED.

SIDEWALK RAMP TYPE 2
N.T.S.



NOTES:
1. TO BE USED WHERE SIDEWALK OCCUPIES ENTIRE AREA BETWEEN CURB AND PROPERTY LINE.
2. LANDING AREA MAY BE PROVIDED EITHER SIDE 1:12 SLOPES ON FLARES MUST BE MAINTAINED.

SIDEWALK RAMP TYPE 3
N.T.S.



A
HEAVY TRAFFIC ON ARTERIAL
NO TRAFFIC SIGNAL

B
SIGNALIZED INTERSECTION
TYPICAL RAMP TREATMENTS

C
TRAFFIC CONTROL ON BOTH
STREETS WIDE SIDEWALKS

D
NORMAL TREATMENT
IN RESIDENTIAL AREA

E
MAY BE USED ONLY WHERE TRAFFIC VOLUME IS LOW AND WHERE OTHER FEATURES MAKE DETAIL D IMPRACTICAL.

CITY OF JUNCTION CITY, KANSAS

SIDEWALK AND ADA RAMP DETAILS

MUNICIPAL SERVICES DIRECTOR
GREGORY S. McCAFFERY, P.E.

DATE: 10/08/2013

ENGINEERING DEPARTMENT
700 N JEFFERSON
JUNCTION CITY, KS 66441
(785) 238-3103

DESIGN: –
DRAWN: –

SHEET 1 OF 1

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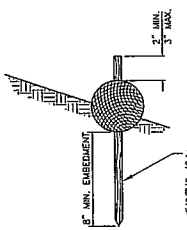
GENERAL SOIL EROSION AND SEDIMENTATION CONTROL NOTES:

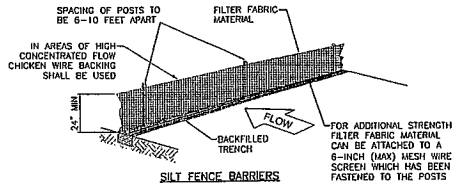
1. THE INTENT OF ALL EROSION CONTROL DEVICES IS TO PREVENT ERODED SOIL FROM ENTERING DITCHES, STORM SEWERS, LAKES, STREETS OR ANY OTHER DRAINAGE FEATURES.
2. THEY ARE INTENDED TO PROVIDE GUIDELINES AS TO WHAT TYPE OF EROSION CONTROL DEVICES WILL BE INSTALLED DURING THE CONSTRUCTION PROCESS.
3. EROSION CONTROL DEVICES SHALL BE MAINTAINED DURING THE CONSTRUCTION PROCESS TO REMAIN EFFECTIVE. MAINTENANCE SHALL BE AS REQUIRED TO MAINTAIN THE CONTROLS.
4. ANY DEVELOPMENT THAT DISTURBS 1 ACRE OR MORE WILL REQUIRE A FEDERAL/STATE NPDES STORMWATER PERMIT. THE PREPARATION OF A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IS REQUIRED. EROSION CONTROL DEVICES ARE REQUIRED. THE DETAILS SHOWN ON THIS SHEET ARE THE MINIMUM STANDARDS TO BE SHOWN ON THE SWPPP.
5. FOR DEVELOPMENTS SMALLER THAN 1 ACRE, SOIL EROSION DEVICES ARE REQUIRED. ALSO, DEVELOPERS AND CONTRACTORS ARE ENCOURAGED TO DEVELOP POLLUTION PREVENTION PLANS FOR EACH PROJECT PRIOR TO CONSTRUCTION.
6. CONCRETE WASH OR RINSE WATER FROM CONCRETE MIXING EQUIPMENT, TOOLS AND/OR READY-MIX TRUCKS, TOOLS, ETC. MAY NOT BE DISCHARGED INTO OR BE ALLOWED TO RUN DIRECTLY INTO ANY EXISTING WATER BODY OR STORM INLET. ONE OR MORE LOCATIONS FOR CONCRETE WASH OUT WILL BE DESIGNATED ON SITE, SUCH THAT DISCHARGES DURING CONCRETE WASHOUT WILL BE CONTAINED IN A SMALL AREA WHERE WASTE CONCRETE CAN SOLIDIFY IN PLACE.
7. THE CONTRACTOR SHALL PREVENT THE POLLUTION OF STREAMS, LAKES, WETLANDS, DRAINAGE WAYS OR STORM SEWERS FROM FUEL, OILS, HAZARDOUS CHEMICALS, SEDIMENT, TRASH, DEBRIS, OR OTHER SUBSTANCES RESULTING FROM CONSTRUCTION ACTIVITIES. ALL SPILLS IN EXCESS OF REPORTABLE QUANTITIES SHALL BE REPORTED TO ALL OF THE FOLLOWING WITHIN 24 HOURS OF THEIR OCCURRENCE: KDHE 24-HOUR SPILL RESPONSE CENTER (785) 296-1679; KDHE NORTH CENTRAL DISTRICT, SALINA, (785) 827-9639; AND THE NATIONAL SPILL RESPONSE CENTER 1-800-424-8802. SPILLS THAT POSE IMMEDIATE THREAT TO PUBLIC SAFETY OR CONTAMINATION OF A WATER BODY SHALL BE REPORTED IMMEDIATELY TO THE JUNCTION CITY FIRE DEPARTMENT AT 911. SUCH SPILLS SHALL ALSO BE REPORTED TO THE KANSAS DIVISION OF EMERGENCY MANAGEMENT, (800) 275-0297 OR (785) 296-8013.



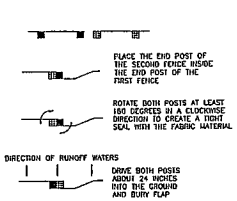
WATTLE NOTES:

1. FIBER LOGS MAY BE USED IN LIEU OF WATTLES.
2. THE DIAMETER OF WATTLE OR FIBER LOG SHALL BE AT LEAST 12-INCHES.
3. WATTLES OR FIBER LOGS MUST BE WRAPPED WITH NON-PLASTIC WRAPPING. COCONUT OR ASPEN FIBER SHALL BE USED FOR FIBER LOGS AND WATTLES.
4. THE WATTLES OR FIBER LOGS SHALL BE INSPECTED AFTER EVERY RAINFALL TO DETERMINE IF ANY PART OF THE BARRIER NEEDS TO BE REPAIRED OR REPLACED. IF IT IS DETERMINED THAT THE BARRIER NEEDS ANY REPAIR OR REPLACEMENT THIS SHALL BE DONE IMMEDIATELY.
5. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH RAINFALL OR BEFORE THEY ACCUMULATE TO 1/2 OF THE WATTLE OR FIBER LOG HEIGHT.
6. INSTALL WATTLES OR FIBER LOGS SNUGLY INTO THE TRENCH. ABUT ADJACENT WATTLES OR FIBER LOGS TIGHTLY, END TO END, WITHOUT OVERLAPPING THE ENDS.
7. STAKES SHALL BE INSTALLED AT EACH END OF WATTLE OR FIBER LOG, AND AT 4' O.C. ALONG ENTIRE LENGTH.
8. PROVIDE MULTIPLE WATTLES UPHILL FOR WATTLE DITCH CHECK CONFIGURATION OR AS NEEDED.
9. WATER FROM TRENCH DEWATERING TO BE PUMPED BEHIND COMPOST BERM OR WATTLE TO BE FILTERED.

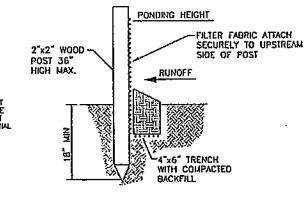
WATTLE INSTALLATION
N.T.S.



SILT FENCE BARRIERS



ATTACHING TWO SILT FENCES



ANCHOR DETAIL

MATERIAL SPECIFICATION:
SILT FENCE FABRIC SHOULD CONFORM TO THE AASHTO M288 96 SILT FENCE SPECIFICATION. THE POSTS USED TO SUPPORT THE SILT FENCE FABRIC SHOULD BE A HARDWOOD MATERIAL WITH THE FOLLOWING MINIMUM DIMENSIONS: 2" SQUARE (NOMINAL) BY 4' LONG. SILT FENCE FABRIC SHOULD BE ATTACHED TO THE WOODEN POSTS WITH STAPLES, WIRE, ZIP TIES, OR NAILS.

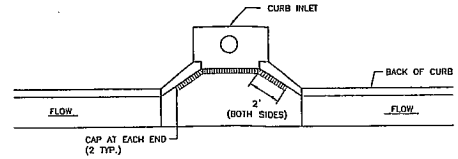
PLACEMENT:
A SLOPE BARRIER SHOULD BE USED AT THE TOE OF A SLOPE WHEN A DITCH DOES NOT EXIST. THE SLOPE BARRIER SHOULD BE PLACED ON NEARLY LEVEL GROUND 5' TO 10' AWAY FROM THE TOE OF A SLOPE. THE BARRIER IS PLACED AWAY FROM THE TOE OF THE SLOPE TO PROVIDE ADEQUATE STORAGE FOR SETTLING OUT SEDIMENT. WHEN PRACTICABLE, SILT FENCE SLOPE BARRIERS SHOULD BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW. SILT FENCE SLOPE BARRIERS CAN ALSO BE PLACED ALONG RIGHT-OF-WAY FENCE LINES TO KEEP SEDIMENT FROM CROSSING ONTO ADJACENT PROPERTY. WHEN PLACED IN THIS MANNER, THE SLOPE BARRIER WILL NOT LIKELY FOLLOW CONTOURS.

PROPER INSTALLATION METHOD:
EXCAVATE A TRENCH THE LENGTH OF THE PLANNED SLOPE BARRIER THAT IS 6" DEEP BY 4" WIDE. MAKE SURE THAT THE TRENCH IS EXCAVATED ALONG A SINGLE CONTOUR. WHEN PRACTICABLE, SLOPE BARRIERS SHOULD BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW. PLACE THE SOIL ON THE UPSLOPE SIDE OF THE TRENCH FOR LATER USE. ROLL OUT A CONTINUOUS LENGTH OF SILT FENCE FABRIC ON THE DOWNSLOPE SIDE OF THE TRENCH. PLACE THE EDGE OF THE FABRIC IN THE TRENCH STARTING AT THE TOP UPSLOPE EDGE. LINE ALL THREE SIDES OF THE TRENCH WITH THE FABRIC. BACKFILL OVER THE FABRIC IN THE TRENCH WITH THE EXCAVATED SOIL AND COMPACT. AFTER FILLING THE TRENCH, APPROXIMATELY 24" TO 36" OF SILT-FENCE FABRIC SHOULD REMAIN EXPOSED. LAY THE EXPOSED SILT FENCE UPSLOPE OF THE TRENCH TO CLEAR AN AREA FOR DRIVING IN THE POSTS. JUST DOWNSLOPE OF THE TRENCH, DRIVE POSTS INTO THE GROUND TO A DEPTH OF AT LEAST 18". PLACE POSTS NO MORE THAN 4' APART. ATTACH THE SILT FENCE TO THE ANCHORED POST WITH STAPLES, WIRE, ZIP TIES, OR NAILS. SEE DETAIL FOR ATTACHING TWO SILT FENCES. IN AREAS OF HIGH CONCENTRATED FLOW, CHICKEN WIRE SHALL BE USED. OPTIONAL: SLICING WHEEL SILT FENCE MAY BE USED AS AN ALTERNATIVE IN PLACE OF BACKFILLED TRENCH. SLICING WHEEL SILT FENCE SHALL BE PLACED AS PER MANUFACTURER'S DIRECTION.

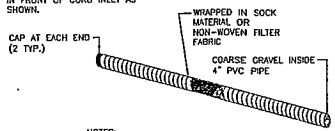
LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:
WHEN PRACTICABLE, DO NOT PLACE SILT FENCE SLOPE BARRIERS ACROSS CONTOURS. SLOPE BARRIERS SHOULD BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW. WHEN THE FLOW CONCENTRATES, IT OVERTOPS THE BARRIER AND THE SILT FENCE SLOPE BARRIER QUICKLY DETERIORATES. DO NOT PLACE SILT-FENCE POSTS ON THE UPSLOPE SIDE OF THE SILT FENCE FABRIC. IN THIS CONFIGURATION, THE FORCE OF THE WATER IS NOT RESTRICTED BY THE POSTS, BUT ONLY BY THE STAPLES (WIRE, ZIP TIES, NAILS, ETC.). THE SILT FENCE WILL RIP AND FAIL.
DO NOT PLACE SILT FENCE SLOPE BARRIERS IN AREAS WITH SHALLOW SOILS UNDERLAIN BY ROCK. IF THE BARRIER IS NOT SUFFICIENTLY ANCHORED, IT WILL WASH OUT.
SILT FENCE SLOPE BARRIERS MUST BE DUG INTO THE GROUND-SILT FENCE AT GROUND LEVEL DOES NOT WORK BECAUSE WATER WILL FLOW UNDERNEATH.

INSPECTION AND MAINTENANCE:
SILT FENCE SLOPE BARRIERS SHOULD BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 1/2" OR MORE. THE FOLLOWING IS A LIST OF QUESTIONS THAT SHOULD BE ADDRESSED DURING EACH INSPECTION:
ARE THERE ANY POINTS ALONG THE SLOPE BARRIER WHERE WATER IS CONCENTRATING?
DOES WATER FLOW UNDER THE SLOPE BARRIER?
DO THE SILT FENCES SAG EXCESSIVELY?
HAS THE SILT FENCE TORN OR BECOME DETACHED FROM THE POSTS?
DOES SEDIMENT NEED TO BE REMOVED FROM BEHIND THE SLOPE BARRIER?

SEDIMENT FENCE INSTALLATION
N.T.S.

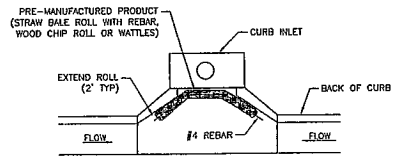


NOTE:
PLACE 4" PERFORATED PVC PIPE, FILLED WITH 1/2"-1" DIA. GRAVEL, IN FRONT OF CURB INLET AS SHOWN.



NOTES:
1. SUBMIT FILTER PLAN AND TYPE FOR APPROVAL
2. UPON CONSTRUCTION OF INLET, FILTER PROTECTION WILL BE PROVIDED. HAY BALES NO LONGER APPROVED.
3. INLET FILTER PROTECTION TO BE LEFT IN PLACE AFTER CONSTRUCTION OF THIS PROJECT. DEVELOPER/OWNER TO DIRECT LOT BUILDER TO MAINTAIN EROSION CONTROL WHILE CONSTRUCTING HOMES OR MAINTAIN THEMSELVES.
4. INLET FILTER TO REMAIN IN PLACE UNTIL 90% OF DRAINAGE AREA IS SODDED OR SEEDED.

CURB INLET PROTECTION I
4" PERFORATED PIPE W/GRAVEL
N.T.S.



NOTES:
1. CURBS ON STEEP SLOPES MAY REQUIRE GRAVEL BAG "CHECKS" OR EQUIVALENT PLACED IN "L" CONFIGURATION TO CAPTURE SEDIMENT.
2. EQUIVALENT INLET PROTECTION MAY BE USED.

CURB INLET PROTECTION III
PRE-MANUFACTURED STRAW BALE ROLL
N.T.S.

CITY OF JUNCTION CITY, KANSAS

SOIL EROSION AND SEDIMENTATION CONTROL DETAILS

MUNICIPAL SERVICES DIRECTOR	DATE
GREGORY S. McCAFFERY, P.E.	10/08/2013

ENGINEERING DEPARTMENT 700 N JEFFERSON JUNCTION CITY, KS 66441 (785) 238-3103	DESIGN: –	DRAWN: –

SHEET 1 OF 2

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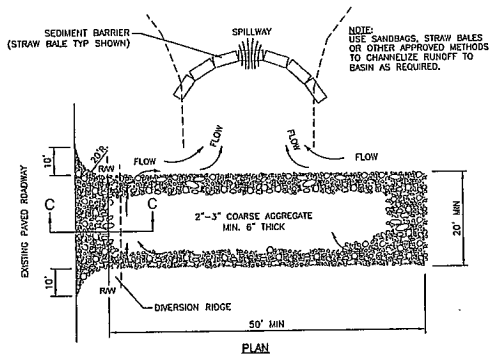
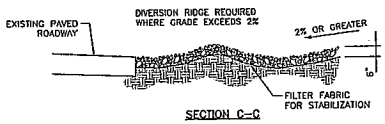


PLAN

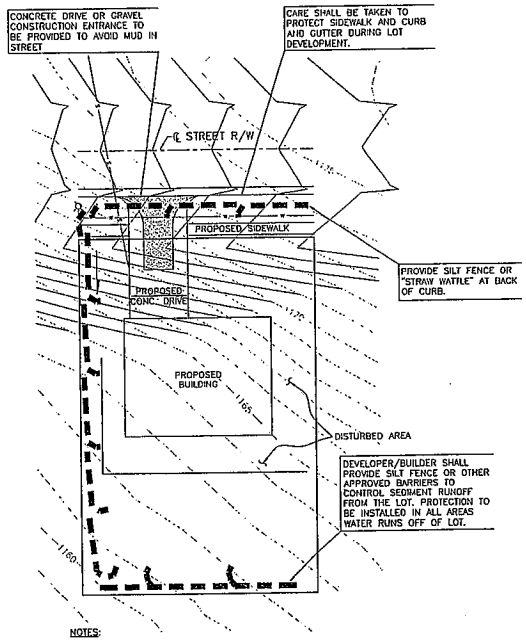


SECTION C-C

NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. AVOID LOCATING ON STEEP SLOPES OR AT CURVES ON PUBLIC ROADS. IF POSSIBLE, LOCATE WHERE PERMANENT ROADS WILL EVENTUALLY BE CONSTRUCTED.
3. INSTALL PIPE UNDER THE ENTRANCE IF NEEDED TO MAINTAIN DRAINAGE DITCHES ALONG PUBLIC ROADS.
4. DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE ENTRANCE TO A SEDIMENT CONTROL DEVICE..
5. STONE SIZE - USE 3" STONE OR RECLAIMED OR RECYCLED EQUIVALENT.
6. LENGTH - AS REQUIRED, BUT NOT LESS THAN 50 FEET.
7. THICKNESS - NOT LESS THAN 6".
8. WIDTH - TWENTY (20) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OCCURS .
9. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE..
10. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
11. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
12. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED AFTER EACH RAIN.

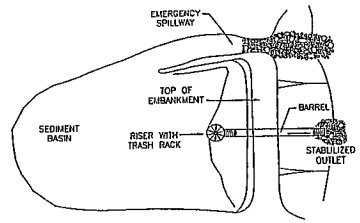
STABILIZED CONSTRUCTION ENTRANCE
N.T.S.



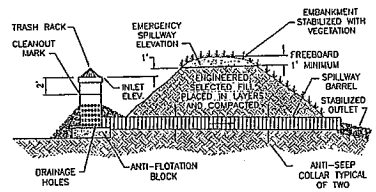
NOTES:

1. NO SILT, MUD OR DEBRIS TO BE ALLOWED IN STREET. STREETS TO BE MAINTAINED IN A CLEAN CONDITION DAILY AND AFTER RAIN EVENTS.
2. EROSION AND SEDIMENT PROTECTION TO REMAIN IN PLACE UNTIL TURF IS ESTABLISHED ON LOT.

LOT DEVELOPMENT
(BY OTHERS AT TIME OF HOUSE CONSTRUCTION)
N.T.S.



PLAN



SECTION

NOTES:

1. THE TEMPORARY SEDIMENT BASIN, DESIGNED BY A QUALIFIED PROFESSIONAL, IS REQUIRED FOR DISTURBED AREAS GREATER THAN 10 ACRES WITHIN A DRAINAGE AREA LESS THAN 50 ACRES.
2. THE SEDIMENT BASIN WILL BE REMOVED WITHIN THREE YEARS.

TYPICAL SEDIMENT BASIN
N.T.S.

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CITY OF JUNCTION CITY, KANSAS

SOIL EROSION AND SEDIMENTATION CONTROL DETAILS

MUNICIPAL SERVICES DIRECTOR
GREGORY S. McCAFFERY, P.E.

DATE:
10/08/2013

ENGINEERING DEPARTMENT
700 N JEFFERSON
JUNCTION CITY, KS 66441
(785) 238-3103

DESIGN: --
DRAWN: --

SHEET 2 OF 2